Fluctuating International Relations in a Covid-19 World and the Politics of Sport Mega-Events

2020 GLOBAL SPORT SCIENCE VIRTUAL CONFERENCE

Date Friday, 13th, November, 2020 / 13:00~16:30

ZOOM Link https://snu-ac-kr.zoom.us/j/3427707352

Host SNU Institute of Sport Science

Support Department of Physical Education, SNU

Conference Schedule

ZOOM Link : https://snu-ac-kr.zoom.us/j/3427707352

Time	Contents	
12:00-13:00 Registration & Welcome Reception		
13:00-13:05	**Opening Address**	(Prof) Park, Jaebum (Director, Institute of Sport Science)
13:05-13:10	**Welcoming Address**	(Prof) Lee, Seon-Young (Associate Dean, College of Educatio)
SESSION 01 13:10~15:10		Chair: (Prof) Kim, Yukyoum (Seoul National University)
13:10-13:35	**Thermal and fluid demands during endurance running in the heat**	
	(Prof) **Jason Kai Wei Lee** (National University of Singapore)	
13:40-14:05	**Challenge of NSSU Coach Developer Academy : Creating a localized learner-centered coaching culture**	
	(Prof) **Masamitsu ITO** (Nippon Sport Science University)	
14:10-14:35	**Cognitive and Emotional Processing of TV Commercials in Mediated Sports : A Re-Inquiry Using a Psycho-physiological Approach**	
	(Prof) **Lee, Minkyo** (East Stroudsburg University)	
14:40-15:05	**Fluctuating International Relations in a Covid-19 World and the Politics of Sport Mega-Events**	
	(Prof) **Lee, Jung Woo** (University of Edinburgh)	
15:10-15:30 Break Time		
SESSION 02 15:30~16:30		Chair: (Prof) Moon, hyoyoul (Seoul National University)
15:30-15:45	**The Effect of Exercise-Induced Apelin Secretion on Cognitive Function in Patients with Mild Cognitive Impairment**	
	Bae, Junhyun (Seoul National University)	
15:50-16:05	**Exploring the Coordination process and Education Logics on the Qualification Training System for Level 2-Life-Sports-Coach through Institutional Ethnography**	
	Ryou, Ju-young (Seoul National University)	
16:10-16:25	**The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities : Based on the Interrupted Time Series Analysis**	
	Ahn, Chiyoung (Seoul National University)	
16:30	**Closing Remarks**	(Prof) Park, Jaebum (Director, Institute of Sport Science)

Host : Institute of Sport Science, Seoul National University
Support : Department of Physical Education, Seoul National University

Opening Speech

Greetings!

On behalf of Seoul National University, It is my great honor and privilege to welcome all of you to the '2020 Global Sport Science Virtual Conference.'

The Seoul National University Institute of Sport Science, which was established in 1978, has been developed as leading institute in the field of sport-related studies. So far, the institute has conducted diverse and high-quality researches and academic activities.

The Global Sport Science Conference, hosted by Seoul National University Institute of Sport Science, is an academic event that began in 2013 to promote interdisciplinary communication and cross-disciplinary exploration.

The '2020 Global Sport Science Virtual Conference' consists of lectures by invited scholars and oral presentations by graduate students.

Although the conference is being held virtually, I hope our meeting today will provide an opportunity to share your ideas from diverse areas of sport science, and gain valuable insight in your field of research. I also sincerely hope that this academic event will serve as a springboard for you to promote further research and expand your field.

Once again, I would like to express my gratitude to all invited scholars for attending today's academic event and sharing your knowledge and insights. I wish it will be a time for all of you a meaningful and valuable time. Thank you!

November 13, 2020
Jaebum Park
Director, Institute of Sport Science

Welcoming Speech

Ladies and Gentlemen

I sincerely congratulate the opening of the '2020 Global Sport Science Virtual Conference' and welcome all distinguished scholars, professors, students and attendees.

As we all know, the field of sport has developed rapidly in terms of quantity and diversity of research subject. Sports in general as well as in academia has influenced many aspects of human life both in and outside the field.

Seoul National University Institute of Sport Science has continued to develop as a leading body and has strived to be a pioneer in the field. The Global Sport Conference by the Institute of Sport Science aims to provide researchers, scholars and practitioners with knowledge and creative ideas through inter-disciplinary communications across various fields.

If you look through the list of presentations for today's conference, you may notice that the quality of the papers is amazing. I hope that all the attendees will be able to offer creative and critical insights into research in sports.

I am grateful to the many experts who have come to share their knowledge and expertise through this conference. I would also like to extend my gratitude to faculty and staff members of the Institute of Sport Science who have worked so hard to prepare this conference.

Although the conference is being held virtually due to the current circumstances with Covid-19, I wish the conference a great success and hope that all attendees will enjoy and learn much from this wonderful journey. Thank you.

November 13, 2020

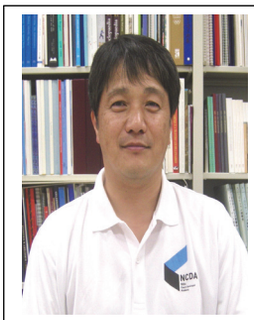
Seon-Young Lee

Associate Dean for Planning and International Affairs

College of Education

Profiles of Invited Speakers

 Jason Kai Wei Lee	**Position**	Research Associate Professor, Department of Physiology, Yong Loo Lin School of Medicine, National University of Singapore
	Major	Human Performance and Applied Physiology
	Title	**Thermal and fluid demands during endurance running in the heat**

 Masamitsu ITO	**Position**	Professor and Deputy Director, NSSU Coach Developer Academy, Nippon Sport Science University
	Major	Coaching Studies
	Title	**Challenge of NSSU Coach Developer Academy -Creating a localized learner-centered coaching culture-**

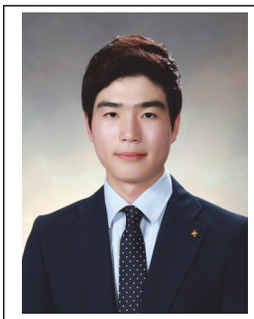
 Lee, Minkyo	**Position**	Assistant Professor, Department of Sport Management, East Stroudsburg University
	Major	Sport Communication and Consumer Behavior
	Title	**Cognitive and Emotional Processing of TV Commercials in Mediated Sports : A Re-Inquiry Using a Psycho-physiological Approach**

 Lee, Jung Woo	**Position**	Programme Director and Lecturer, Moray House School of Education and Sport University of Edinburgh
	Major	Sport Policy, Management and International Development
	Title	**Fluctuating International Relations in a Covid-19 World and the Politics of Sport Mega-Events**

Profiles of Graduate Speakers

Bae, Junhyun

Position	PhD.(candidate) Seoul National University
Major	Exercise Physiology
Title	**The Effect of Exercise-Induced Apelin Secretion on Cognitive Function in Patients with Mild Cognitive Impairment**



Ryou, Ju-young

Position	Master. Seoul National University
Major	Sport Pedagogy
Title	**Exploring the Coordination process and Education Logics on the Qualification Training System for Level 2-Life-Sports-Coach through Institutional Ethnography**

Ahn, Chiyoung

Position	PhD.(student) Seoul National University
Major	Global Sport Management
Title	**The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related-Facilities -Based on the Interrupted Time Series Analysis-**

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SESSION 01

2020
Global Sport Science
Virtual Conference

1. Thermal and fluid demands during endurance running in the heat

▸▸ Jason Kai Wei Lee
(National University of Singapore, Singapore)

Presentation Title 1

Thermal and fluid demands during endurance running in the heat

Jason Kai Wei Lee (National University of Singapore, Singapore)

Exercising in the heat often results in elevation in body temperature. This is the cumulative result of more heat being produced by the working muscles than heat loss to the environment coupled with hot and/or humid environmental conditions. Studies have shown that an accelerated increase in body temperature could impair both exercise performance (i.e. time trial) and exercise capacity (i.e. time to exhaustion). In order to optimise exercise tolerance in the heat, various strategies are employed to alter heat strain such as maximising aerobic fitness, heat acclimatisation, pre-exercise cooling and fluid ingestion. Specific to fluid ingestion, the recommended volume to ingest before and after exercise is widely accepted. There are however differing views regarding fluid replacement during exercise. Severe under or over hydration has ill effects and therefore there is a need to drink correctly. Optimising the cooling effect from hydration solution by manipulating drink temperature and thermal capacity can enhance exercise tolerance especially in the heat.

SESSION 1

2020
Global Sport Science
Virtual Conference

2. Challenge of NSSU Coach Developer Academy

Creating a localized learner-centered coaching culture

▸▸ Masamitsu ITO
(Nippon Sport Science University, Japan)

Presentation Title 2

Challenge of NSSU Coach Developer Academy

Creating a localized learner-centered coaching culture

Masamitsu ITO (Nippon Sport Science University, Japan)

Ⅰ. Background

Coaches play an important role not only in athletes' development but also in our society. Many believe that sports can be used as a vehicle to foster good citizenship. However the reality is not that simple. Good coaches can use sports as a good tool to develop many virtues in athletes. It is unfortunate that coaches can lead their athletes to the opposite direction as well. How to develop a good coach has been a longstanding concern.

The traditional coach education program has consisted of lectures by experts in sports medicine & science and related disciplines. The effectiveness of these programs has been questioned in various previous studies, and more recently it has been suggested that there is a need to create a more hands-on, learner-centered learning experience. The concept of the coach-developer was born out of this trend. In some countries and sports organizations' coach development programs, coach developers who are trained to help coaches learn the HOW of coaching have started to replace content experts in sports medicine, science and other disciplines.

Ⅱ. Action

Nippon Sport Science University established an academy which develops coach developers from around the world with the international council for coaching excellence in 2014. The first program was held in February 2015 and only six people participated. Since then, the academy has kept growing and word of mouth have attracted many others to apply to this program. Over the past six years, 96 coach developers from 41 countries have come together to hone their skills as coach developers at NCDA. The graduates of NCDA have been active to develop coaches or

their own coach development systems around the world.

In Japan, the NCDA's expertise has been instrumental in the reform of the Japan Sports Association's coach certification system and the accompanying revision of coach development methods. The current training courses are designed to support coaches' active learning by coach-developers. Many of trained coach-developers are university professors and there has been a change in the way they teach in universities. The government-funded elite female coach development program also leverages the expertise developed through the NCDA to provide blended learning opportunities that combine workshops (conducted online, in part due to COVID-19 pandemic), on-the-job training, mentoring, and working in communities of practice.

Ⅲ. Future Suggestions

Both those who have been trained as coach developers and coaches who have been trained with the support of trained coach developers have shown a very positive response. In Asia, in addition to Japan, Singapore is working with the NCDA to introduce a coach-developer system. Hopefully more countries and institutions in Asia will form partnerships with the NCDA and work together to develop methodologies to improve athletic performance while maximizing the well-being of the athletes.

Challenge of NSSU Coach Developer Academy

Creating a localized learner-centered coaching culture

Masamitsu ITO, Ph.D.

Professor (Coaching Studies)

Director, NSSU Center for Coaching Excellence

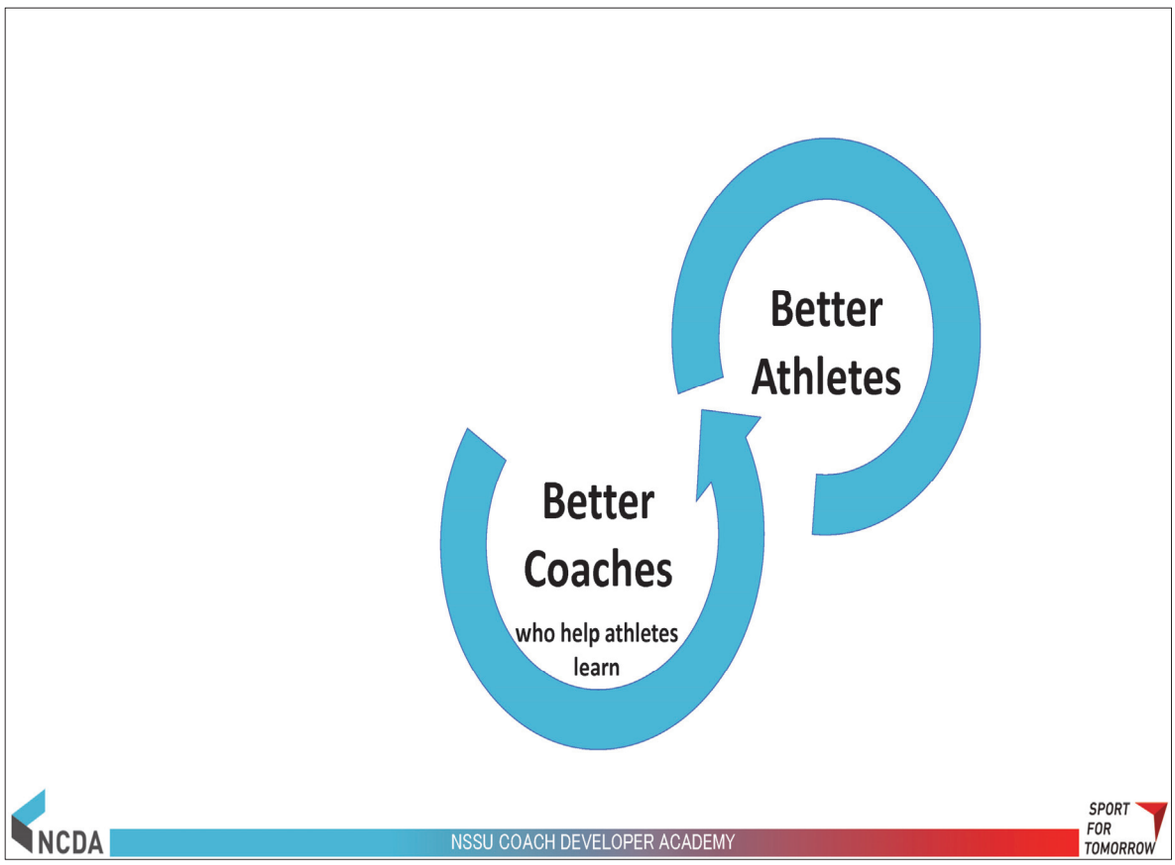
Deputy Director, NSSU Coach Developer Academy

Nippon Sport Science University

itom@nittai.ac.jp

Outline

- Need fo Coach developers
- NSSU Coach Developer Academy
- Contribution of NCDA


Better
Athletes
Better
Coaches
who help athletes
learn
NCDA
NSSU COACH DEVELOPER ACADEMY
SPORT
FOR
TOMORROW


Bright and Dark Sides of Coaching in Japan
1
2
3
JAPAN OLYMPIC
HUMAN
RIGHTS
WATCH
"I Was Hit So Many Times
I Can't Count"
Abuse of Child Athletes in Japan
NCDA
NSSU COACH DEVELOPER ACADEMY
SPORT
FOR
TOMORROW

HOW to Coach

Brief History of JSPO Sports Coach Development Scheme

1964: Tokyo Olympics

1965: Development of Sport Trainers (coaches)

To pass KNOW-HOW of athlete development for Tokyo 1964

1977: Certified sports coaching qualifications

1988: 1st Revision

2005: 2nd Revision

2019: 3rd Revision

JSPO
Japan Sport Association

Certified Sports Coaching Qualification

Sports leader	349,218
Coach Lv.1	111,607
Coach Lv.2	12,483
Coach Lv.3	18,488
Coach Lv.4	5,808
Appointed CD	120
Appointed CT	9

CD: Coach Developer, CT: Coach Trainer

NEED for BEHAVIORAL CHANGE
Athlete-Centered Coaching


From Passive Learning to Active Learning
●●ology
▲▲ology
■■ology
NCDA
NSSU COACH DEVELOPER ACADEMY
SPORT FOR TOMORROW


Creating a better coaching culture
Better Coach Developers
who help coaches learn
Better Athletes
Better Coaches
who help athletes learn
NCDA
NSSU COACH DEVELOPER ACADEMY
SPORT FOR TOMORROW

Impact of NSSU Coach Developer Academy

Vision

To create a coaching culture in sport that leads to a positive experience for everyone through sport.

Aims

To foster international 'Coach Developers' and to construct network of coach developers all over the world.

Learner-centered Philosophy


Learner-centered Program
LEARNER-CENTRED
ENVIRONMENT
ACTIVELY INVOLVED
REFLECTION
NEW LEARNING
STRETCH
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L
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N
R
NCDA
NSSU COACH DEVELOPER ACADEMY
SPORT FOR TOMORROW


2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
SPORT FOR TOMORROW
NCDA
NSSU COACH DEVELOPER ACADEMY
SPORT FOR TOMORROW

NCDA **Global Expansion** Contextualization(Glocalization) ICCE International Council for Coaching Excellence

NCDA **Global Expansion** Contextualization(Glocalization) ICCE International Council for Coaching Excellence

2019 JSPO Coach Developer Program

JSPO Japan Sport Association

Coach Developer Development Program (2019)

To complete the program, coach developer candidates need to be able to

1. show adequate skills to support active learning of participants in the JSPO Lv.1~3 generic programs
2. assess participants in the JSPO Lv.1~3 generic programs
3. critically reflect on own practice
4. explain the structure of the JSPO coaching qualification system
5. clarify what makes good coach whom JSPO is trying to develop
6. describe the aims and structure of JSPO Lv.1~3 generic programs

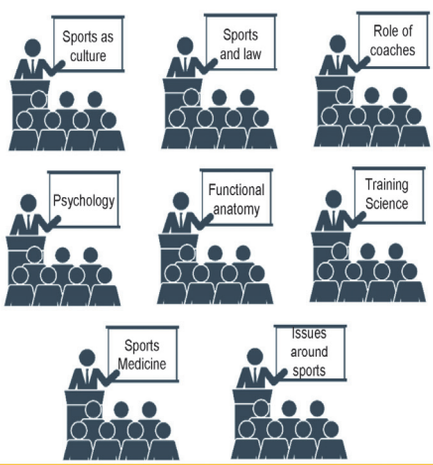
NCDA NSSU COACH DEVELOPER ACADEMY SPORT FOR TOMORROW

JSPO Coaching Qualification Generic Program (Old → New System)

JSPO Japan Sport Association

<OLD> Lectures

Content experts lecture each discipline based on textbooks



<NEW> Workshop

Sessions based on roles and functions of coaches

Opportunity for coaches to reflect on their past experience and obtain new learnings on HOW to coach by being facilitated by coach developers.

Coach Developer : Coach = 1:10~15

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2019 JSPO Generic Program (Lv.3)

JSPO Japan Sport Association

Day 1

Coaching Fundamentals

- Value-based coaching
- Understanding our coaching issues
- What is **Players-centered coaching**?
- Making an ethical decision
- Risk management

Day 2

Creating a better coaching environment

- Elements of coaching environment
- Understanding stakeholders
- Developing desirable relationships
- Evidence-based coaching

Day 3

Enabling quality coaching practice

- Strategic planning
- Conditioning for the best performance
- Outcome-based training
- Authentic and motivated training
- Improving your coaching behavior

Day 4

Growth as a coach

- Learn from diversity in coaching context
- Well-being of a coach
- What makes a good coach
- Plan your learning as a coach

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JSPO Generic Program

NCDA NSSU COACH DEVELOPER ACADEMY SPORT FOR TOMORROW

E-mail from a coach

JSPO Japan Sport Association

Thank you very much for the JSPO generic program level III workshop. Currently, **I am working on what I have set as my personal goal** for a post-workshop practical assignment. An interesting thing happened here. The following three have been my personal goals, and **I asked the parents** of the kids (I coach elementary school kids) **to access me** whether these goals are met when the assignment period is over.

- **Refrain from using questions that would lead the kids to answer "Yes"**
- **Do not give instructions or feedbacks with angry voices or facial expressions**
- **The last word ends with "praise" and "smile" for all players**

Not only did **many parents agree** that this was good, but **they also started to work on practicing the same things together in daily life** as well as team practice.
We haven't practiced or played a few games yet, but I am sensing **clear changes in our attitude and behavior**.
I was so glad and excited to know that **not only I learnt a lot in the workshop but also my learning has a positive impact on the people around me**.
Thank you for your continued guidance.

NCDA NSSU COACH DEVELOPER ACADEMY SPORT FOR TOMORROW

How many female coaches in Japan?

	Male	Female	Ratio
Coach Lv.1	86,563	25,044	22.4%
Coach Lv.2	9,714	2,769	22.2%
Coach Lv.3	15,079	3,409	18.4%
Coach Lv.4	5,344	464	8.0%

	Beijing(2008)	London(2012)	Rio (2016)
Olympics	11.0%	11.6%	12.3%
Paralympics	21.9%	17.2%	20.0%

(Gender Equality Bureau Cabinet Office, 2018)

NCDA NSSU COACH DEVELOPER ACADEMY SPORT FOR TOMORROW

Women Elite Coach Development Program

NSSU Nippon Sport Science University　スポーツ庁 JAPAN SPORTS AGENCY

Formal Learning

Mentoring

Blended Learning

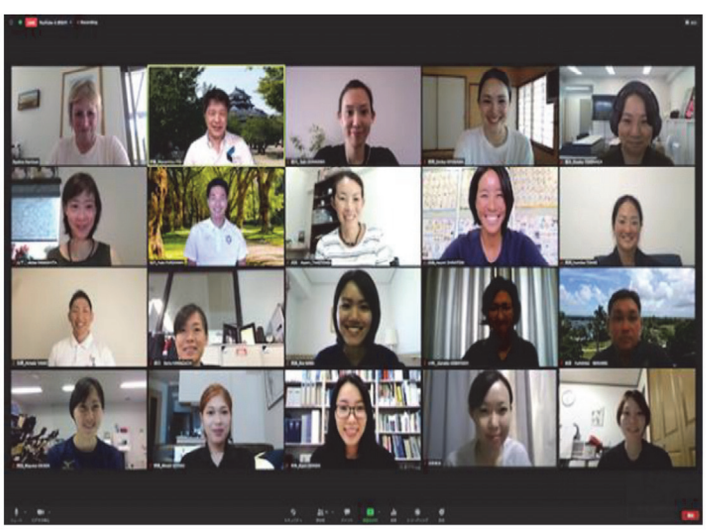
On-the-Job Training

Community of Practice

2 years program with 12 potential elite female coaches

Women Elite Coach Development Program

NSSU Nippon Sport Science University　スポーツ庁 JAPAN SPORTS AGENCY

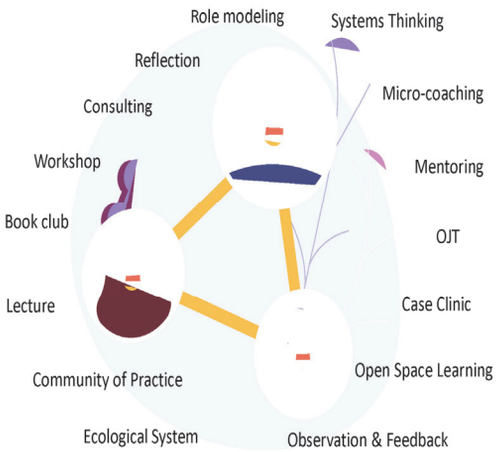


Because of COVID-19 pandemic, the program has been delivered on-line so far.

Women Elite Coach Development Program

NSSU Nippon Sport Science University　スポーツ庁 JAPAN SPORTS AGENCY

Coaches take the ownership of learning



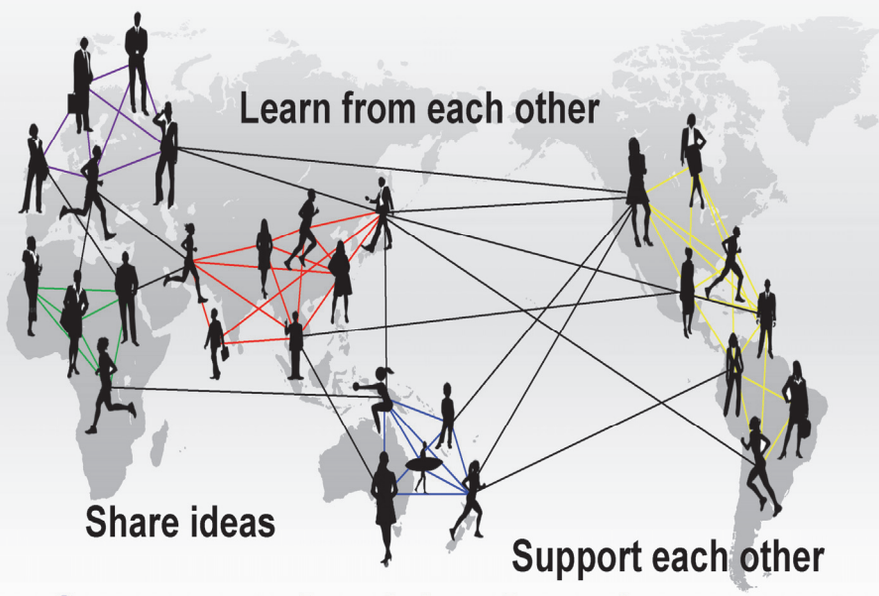
CDs shape the environment

Culture of KAIZEN

Coaches and CDs learn together

NCDA　NSSU COACH DEVELOPER ACADEMY　SPORT FOR TOMORROW

Community of Practice



for sustainable development

NCDA　NSSU COACH DEVELOPER ACADEMY　SPORT FOR TOMORROW

SESSION 01

2020
Global Sport Science
Virtual Conference

3. Cognitive and Emotional Processing of TV Commercials in Mediated-sports

A Re-Inquiry Using a Psycho-physiological Approach

▸▸ Lee, Minkyo
(East Stroudsburg University, USA)

Presentation Title 3

Cognitive and Emotional Processing of TV Commercials in Mediated-sports

A Re-Inquiry Using a Psycho-physiological Approach

Lee, Minkyo (East Stroudsburg University, USA)

The present study aims to reinvestigate a specific topic of how emotional reactions to sport programing influence cognitive information processing of a subsequent TV commercial. The role of emotions is a substantively significant topic in sport consumer research because sport practitioners (e.g., advertisers, event managers) often promote products and services when their targets are emotionally engaged with sporting events (e.g., Wang & Kaplanidou, 2013). However, previous studies on the subject provided mixed results regarding the spillover effects of sport-induced emotions on memory (i.e., Newell at al., 2001; Pavelchak et al., 1988) Thus, it is difficult for advertising practitioners to decide whether considering or ignoring the spillover effects. The current study addresses several theoretical and methodological issues existing in the previous studies by using a different theoretical perspective (i.e., LC4MP) and different methodology (i.e., psycho-physiological experiment).

Ⅰ. Theoretical Perspectives

The research question "how do emotional reactions to a sporting event influence recall for ads broadcasted during the game?" remained the same as the two previous studies in this area (Newell et al., 2001; Pavelchak et al. 1998). The LC4MP posits that emotional valence elicited from a mediated stimuli functions to activate two underlying motivational systems referred to as 'appetitive system' and 'aversive system' (e.g., Lang et al., 2013). For instance, positive emotional feelings (e.g., happiness, hope, joy) are thought to activate appetitive motivational system while negative emotional experiences (e.g., anger, sadness, frustration) are thought to activate aversive motivational system. Furthermore, levels of activation in both motivational systems are determined by arousal intensity. Based on LC4MP, it was hypothesized that there will be main effects of game outcome (victory vs. defeat) and process (close vs. lopsided) on emotional pleasure (Motivational system [H1]) and arousal (Activation Level [H2]).

The LC4MP predicts that increases in appetitive activation should result in increased automatic resource allocation for encoding and retrieval (e.g., Lang et al., 2013). The model posits that arousing pleasant stimuli (medium-high appetitive activation) should result in a greater allocation of cognitive resources to encoding and storage than calm pleasant stimuli (low-moderate appetitive activation). On the other hand, increases in aversive activation should result in a decreased automatic resource allocation for encoding and retrieval (e.g., Lang et al., 2013). Calm negative stimuli (low-moderate aversive activation) should lead to greater allocation of cognitive resources to encoding and storage than arousing negative stimuli (medium to high aversive activation). Thus, it was hypothesized that there will be significant interaction effects between the motivational system (victory vs. defeat) and the level of activation (close vs. lopsided) on cognitive efforts (H3), encoding (H4), and retrieval (H5).

Ⅱ. Methods

The current experiment utilized a 2 (Game outcome: victory, defeat) × 2 (Game process: close, lopsided) × 2 (advertising repetition) repeated measure factorial design. A total of 51 undergraduate students from a large public university participated and completed this study. Upon their arrival, protocols about the experiment were briefly explained except for the main purpose of the study (i.e., memory test). Physiological sensors were attached to each participant's palm, face, and forearms in order to indicate participants' emotional states and attention given to stimuli. Further, each participant was instructed to press the designated button as soon as possible once hearing the secondary task reaction times probes placed in the commercial. Each participant watched eight final segments (4 minutes each) of their team's games and thirty-seconds TV commercials. The uninformed memory tests about advertised brands and contents were conducted.

Ⅲ. Results

As hypothesized, there were significant main effects of game outcome and process on emotional valence (H1: *Corrugator* [$p < .05$], *Self—reported pleasantness* [$p < .001$]) and arousal (H2: *SCL* [$p = .095$] and *Self—reported arousal* [$p < .001$]), respectively. Furthermore, the interaction effects between game outcome and process on cognitive efforts (H3: *Cardiac activity* [$p < .05$], STRTs [$p = .052$]), encoding (H4: *Recognition* [$p <$

.05]), and retrieval (H5: *Recall* [$p < .01$]) were significant or appeared to be marginally significant.

Ⅳ. Discussion

This study makes unique sport management contributions (e.g., theory, methods, measurements, practice) by using a different theoretical perspective (i.e., LC4MP) and different methodology (i.e., psycho-physiological experiment) to re-investigate the spillover effect of sport-induced emotions on memory for advertising. In terms of theoretical contributions, the current study broadens our understanding about the relationship among team performance, emotions, and cognitions. One way in which it does this is by re-conceptualizing sport-induced emotions from the theoretical perspective of the LC4MP. More importantly, the current study clarifies the mixed findings concerning spillover effects (i.e., Newell et al., 2001; Pavelchak et al., 1998) by employing the real time biometric measures. For instance, both real-time (e.g., heart rate) and self-assessed (e.g., recall) data showed robust and consistent patterns regarding the spillover effects (H3, H4, and H5). Given this, uses of biometric measures should be encouraged for future sport management research in order to theorize and investigate sport fans' emotions.

Ⅴ. Reference

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Pavelchak, M. A., Antil, J. H., & Munch, J. M. (1988). The Super Bowl: An investigation into the relationship among program context, emotional experience, and ad recall. *Journal of Consumer Research*, *15*(3), 360-367.

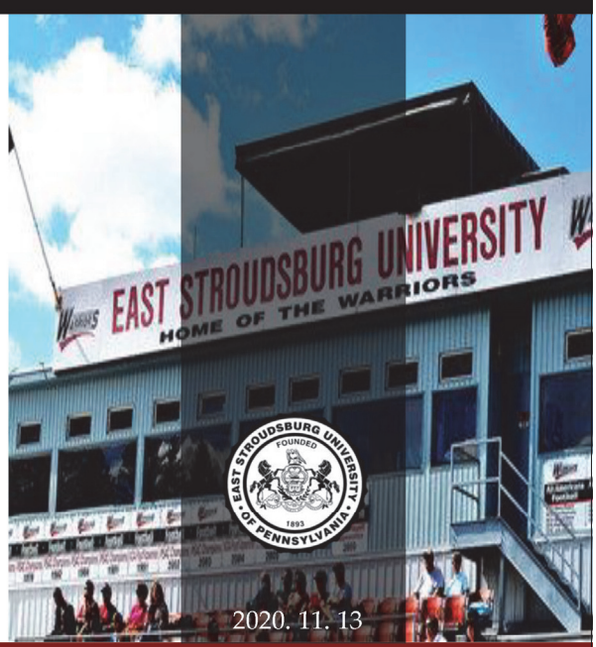
Wang, R. T., & Kaplanidou, K. (2013). I want to buy more because I feel good: The effect of sport-induced emotion on sponsorship. *International Journal of Sports Marketing & Sponsorship*, *15*(1), 57-71.

EAST STROUDSBURG UNIVERSITY

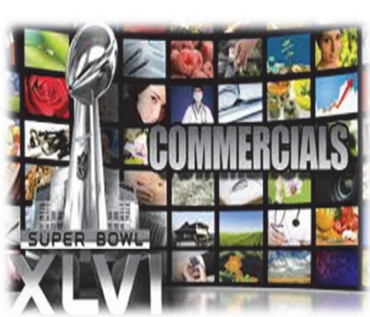
Cognitive and Emotional Processing of TV Commercials in Mediated Sports:

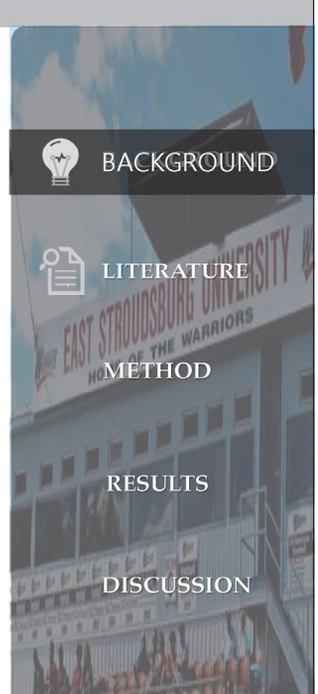
A Re-Inquiry Using a Psychophysiological Approach

Minkyo Lee, PhD



ADVERTISING THROUGH SPORT





EAST STROUDSBURG UNIVERSITY

SPORT & EMOTIONS

The **nature of the content & emotional reactions**

Bryant, Comisky, & Zillmann (1977); Madrigal, Bee, Chen, & LaBarge (2011); Peterson & Raney (2008)

Unique opportunity or **challenge** **from** an advertising practitioner standpoint

Copeland, Frisby, & McCarville (1996); Pyun & James (2011)

BACKGROUND
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EMOTION SPILLOVER EFFECT

The Super Bowl: An Investigation into the Relationship Among Program Context, Emotional Experience, and Ad Recall

MARK A. PAVELCHAK
JOHN H. ANTIL
JAMES M. MUNCH*

VS

The Effects of Pleasure and Arousal on Recall of Advertisements during the Super Bowl

Stephen J. Newell
Bowling Green State University
Kenneth V. Henderson
Morehead State University
Bob T. Wu
Bowling Green State University

Limited understanding of the emotion spillover effect on memory for Ad

Pavelchak, Antil, & Munch (1988), Newell, Henderson, & Wu (2001)

- **Theoretical Weakness (Interaction effect between Valence and Arousal)**
- **Methodological Weakness (Field Experiment, Measurement)**

Replication-Extension study for more confident and robust evidence for the program carry-over effect

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THEORETICAL PERSPECTIVES

Limited Capacity Model for Motivated Mediated Message Process (LC4MP)

Originated via …

- **Dimensional** (Lang, Greenwald, Bradley, & Hamm, 1993)
- **Dual-motivational** (e.g., Cacioppo & Bernston, 1994)
- **Limited capacity media-processing** model (Lang, 2000)

First **Limited amount of cognitive resource**

Humans possess a limited amount of cognitive resource available to process information (e.g., Lang, 2000).

Second **Motivational system impact resource allocation**

The motivational system (i.e., appetitive and aversive) as a function of dimensional emotion (i.e., valence and arousal) automatically impacts the way humans cognitively process information (e.g., Cacioppo & Bernston, 1994).

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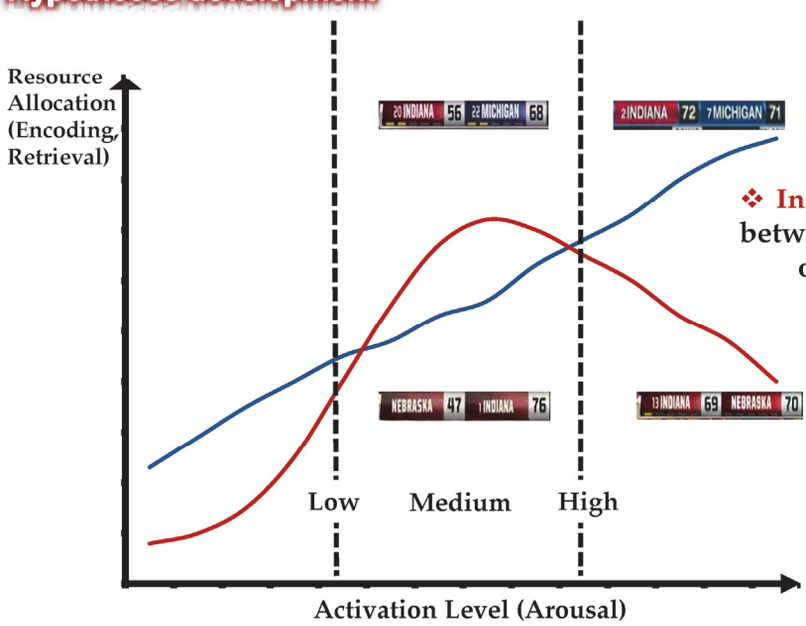
LC4MP

Hypotheses development



Appetitive Activation (Pleasant)

❖ **Interaction Effects**
between Outcomes & Uncertainty
on Cognitive Efforts (H1)
Encoding (H2)
Retrieving (H3)

Aversive Activation (Unpleasant)

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EXPERIMENTAL DESIGN

- 2(**Game outcome**: winning, losing) × 2(**Uncertain outcome**: close, lopsided) × 2(**Video Repetition**) within-subject design

- Eight 30-seconds Ads
- Pre-test (n = 76)
- Outside market
- Unfamiliar brand & Ads

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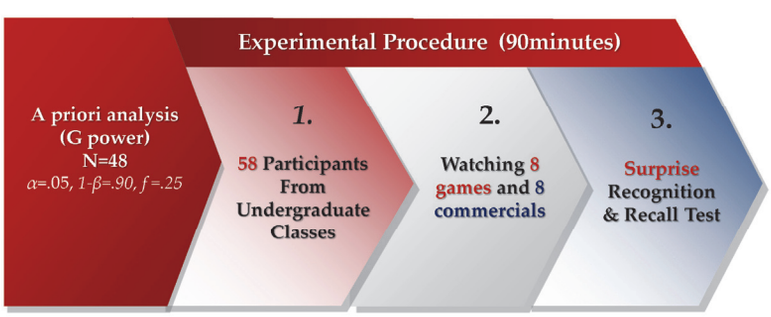
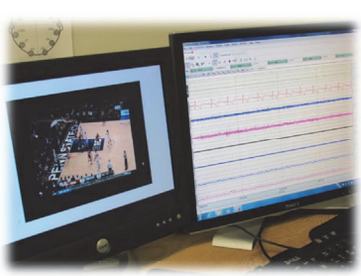
SAMPLE & PROCEDURE





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MEASUREMENTS

Emotions

Facial EMGs

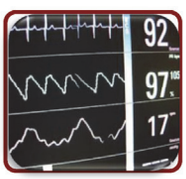
Skin Conductance

Self-Reported

(e.g., Bolls et al., 2001; Potter & Bolls, 2011; Potter & Keene, 2012)

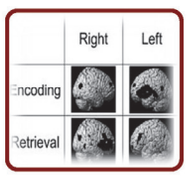
(e.g., Wang & Lang, 2012)

Cognition (Attention & Memory)



Heart Rate

STRTs



Recognition

Recall

(e.g Bolls et al., 2001; Lang, 1995; Potter & Keene, 2012)

(e.g., Chung & Sparks, 2015; Wang & Lang, 2012)

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BRAND RECOGNITION EXAMPLES

TARGET

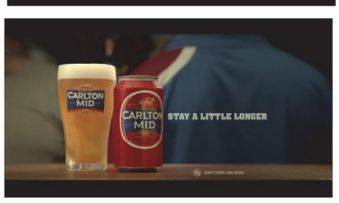
FOIL

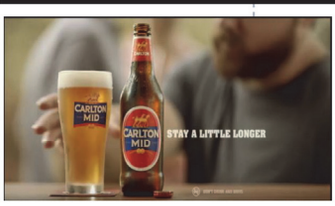
ICELANDAIR

ICELANDAIR

ahm by Medibank

amh





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DATA SCREENING

N=59

Data Screening
(Outliers, Assumption Check)

M = 5.56

~~**n = 8 (not involved)**~~

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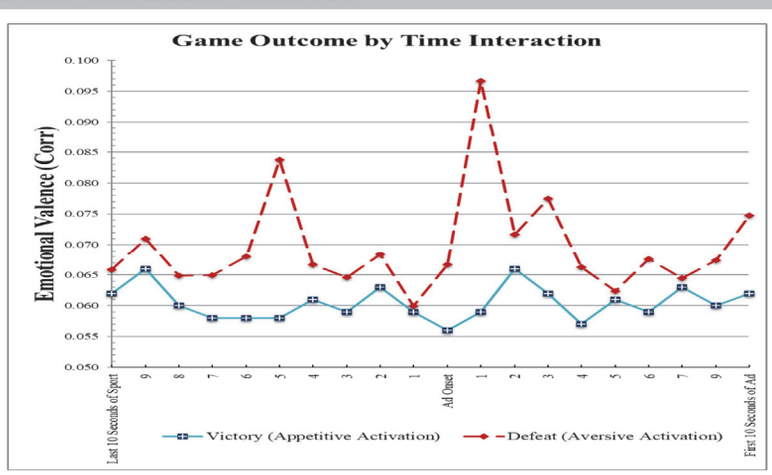
MANIPULATION CHECK



Game outcome → **Unpleasant Emotional Responses (Corrugator)**

$P = < .05, \eta_p^2 = .20$

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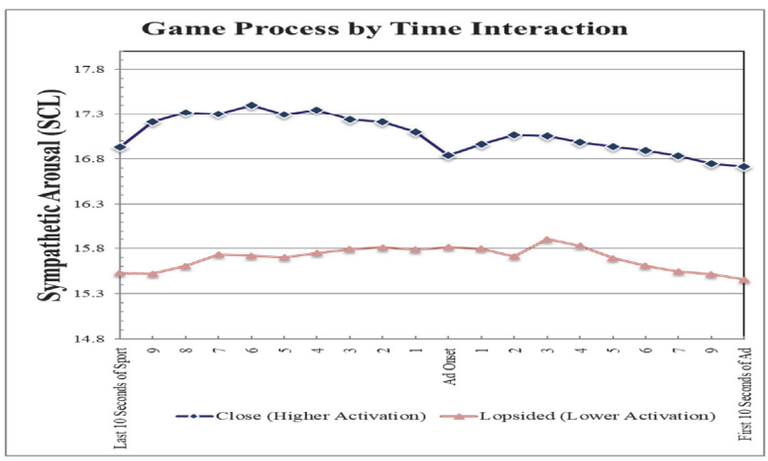
MANIPULATION CHECK (CONT.)



Uncertainty of Outcomes → **Emotional Arousal (Skin Conductance Level)**

$P < .10, \eta_p^2 = .16$

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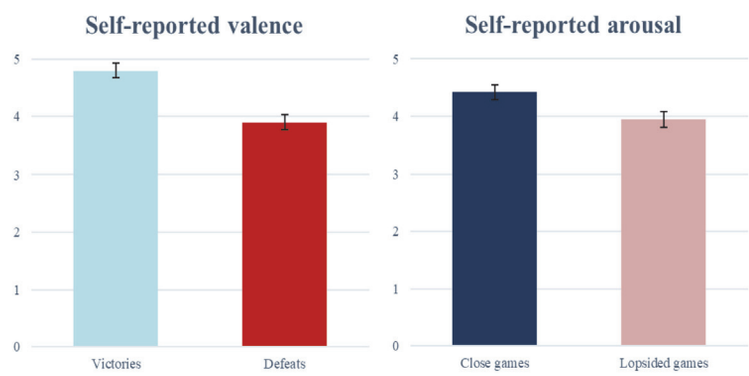
MANIPULATION CHECK (CONT.)



Game Outcome → **Emotional Valence**

$P < .001, \eta_p^2 = .31$

Uncertainty of Outcomes → **Emotional Arousal**

$P < .001, \eta_p^2 = .21$

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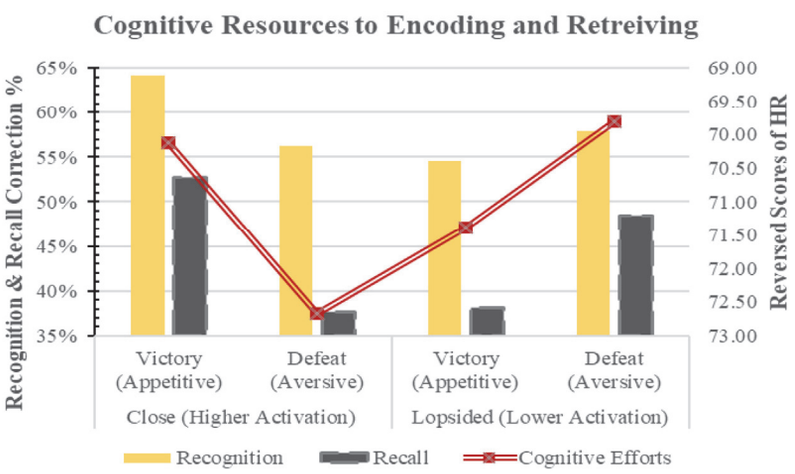
HYPOTHESES TESTING



Interaction Effect between Outcome & Uncertainty
on **Cognitive Effort (H1)**, $p < .05$, $\eta_p^2 = .18$
on **Recognition (H2)**, $p < .05$, $\eta_p^2 = .11$
on **Recall (H3)**, $p < .01$, $\eta_p^2 = .13$

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Second **Emotional nature of sport consumption** leads to different memory outcome, which may make **the sport industry more attractive**

Sport fans' emotional reactions to game results in different patterns of evaluative processing of marketing stimuli.- e.g., Kwak et al. (2011); Wang & Kaplanidou (2013)

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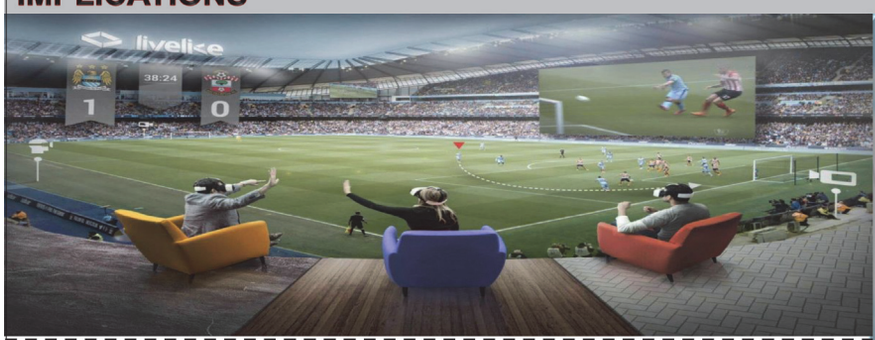
IMPLICATIONS



BACKGROUND

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Third **Uses of biometric measures** should be encouraged for future sport management **research and practice**

As psychophysiological sensor and equipment are getting more affordable and portable, advertisers will be able to measure sport fans' emotional reactions in real time using that equipment.

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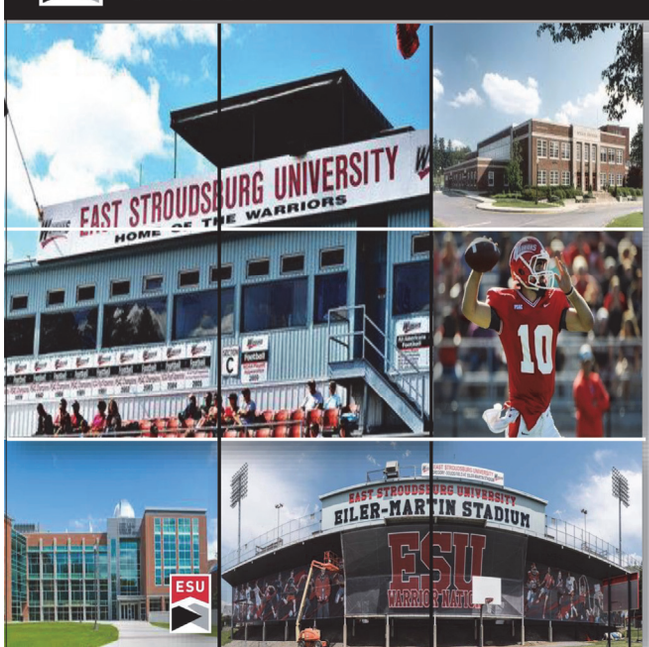

Cognitive and Emotional Processing of TV Commercials in Mediated Sports:

A Re-Inquiry Using a Psychophysiological Approach

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SESSION 01

2020
Global Sport Science
Virtual Conference

4. Fluctuating International Relations in a Covid-19 World and the Politics of Sport Mega-Events

▸▸ Lee, Jungwoo
(University of Edinburgh, UK)

Presentation Title 4

Fluctuating International Relations in a Covid-19 World and the Politics of Sport Mega-Events

Lee, Jungwoo (University of Edinburgh, UK)

Since the outbreak of coronavirus, global politics has observed a series of crisis and conflict. This paper considers how the current fluctuating international relations would shape the undertone of the upcoming sports mega-events to be held in a (post) Covid-19 world, namely the 2020(1) and 2022 Olympic Games in Tokyo and Beijing and the 2022 Commonwealth Games in Birmingham. Few major international sporting events take place in a political vacuum, but these three occasions are more liable to be entangled in nationalist politics and the tensions amongst nations. The relations between Japan and South Korea are particularly thorny nowadays mainly due to the trade dispute in 2019, and the coronavirus epidemic has added more complexity to nationalist politics on both sides. At this juncture, Tokyo 2020(1) may present a platform where such worsening old-foe relations are played out. Chinese politics has recently become more ambitious, and the West, especially the US, is wary of the increasing influence of China on international affairs. While the Sino-American hostility is intensifying, the Covid-19 pandemic creates an environment where China scepticism flourishes in the West. If this mood persists, Beijing 2022 can turn into a new Cold War game. The 2022 Commonwealth Games in Birmingham will be the first major international sporting event to be staged in post-Brexit Britain. The UK Government initiates the "Global Britain" project as its new foreign policy agenda. Additionally, the Black Lives Matter movement, which spread rapidly in the UK during the Covid-19 lockdown, triggers "culture wars" over Britain's colonial past. In this context, Birmingham 2022 may disclose the uneasy intersection between the UK's global imagination and its postcolonial identity conflict.

2020 SNU Global Sport Science Virtual Conference

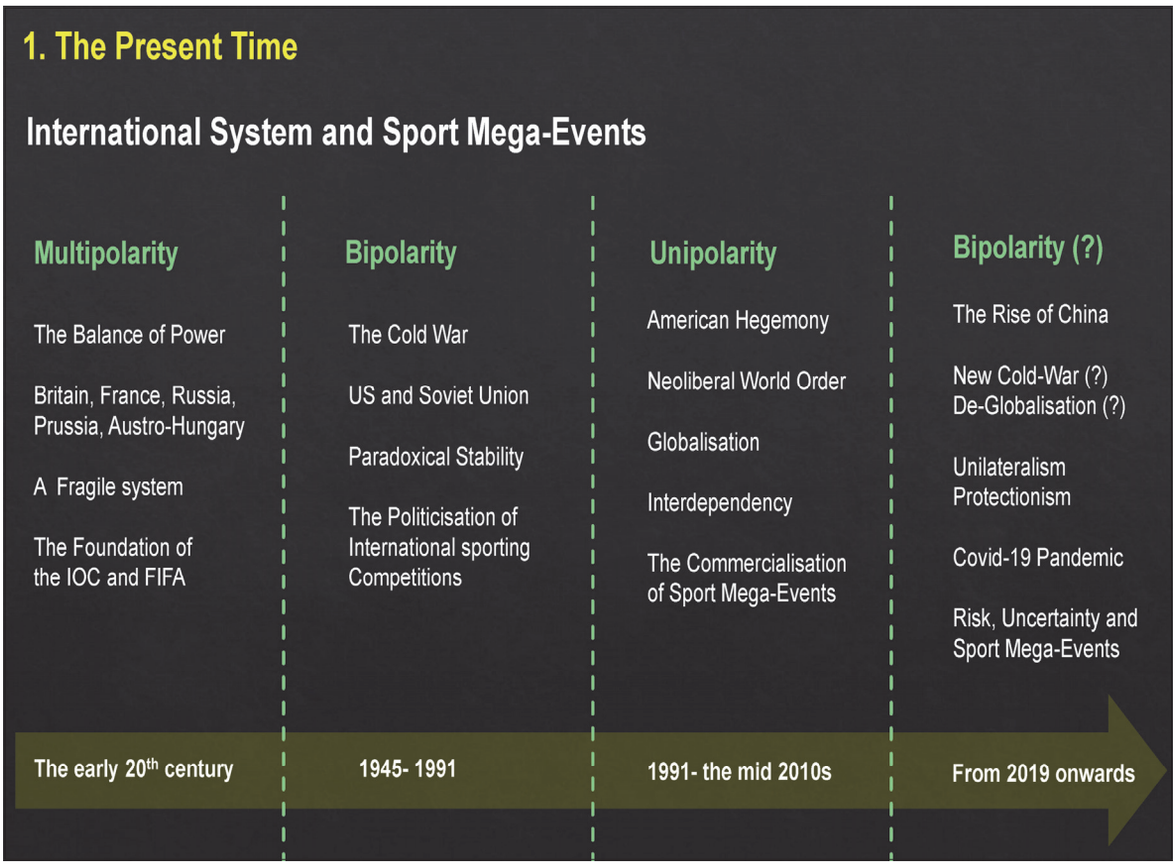
Fluctuating International Relations in a Covid-19 World and the Politics of Sport Mega-Events

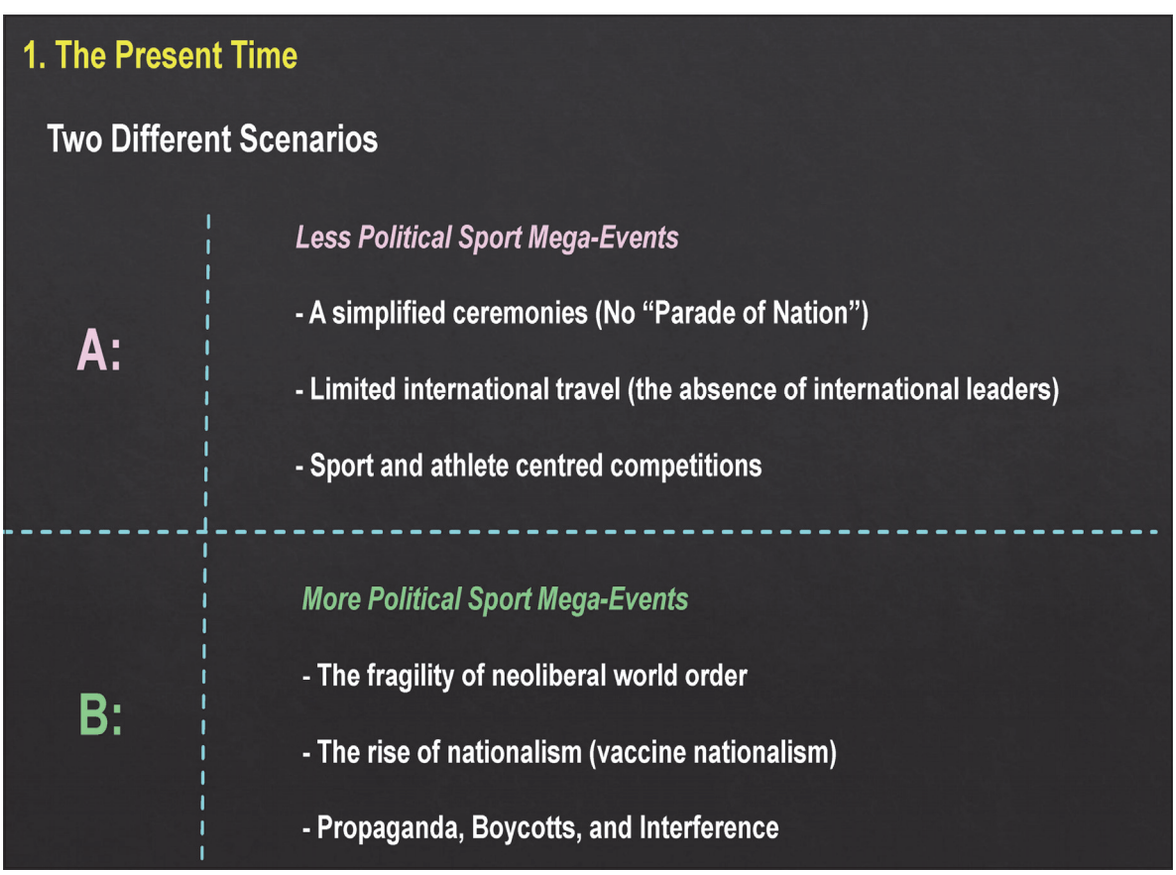
13 November 2020

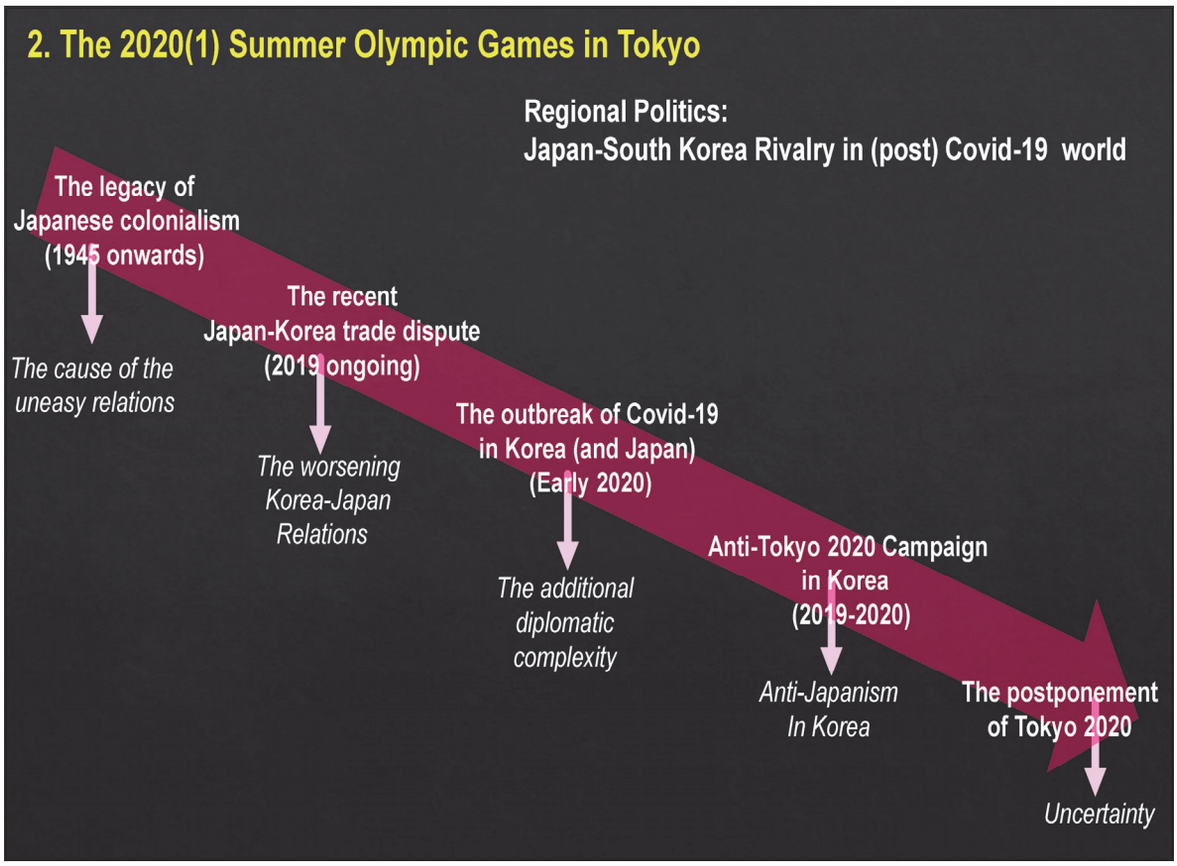
Dr Jung Woo Lee
(University of Edinburgh, UK)

OUTLINE

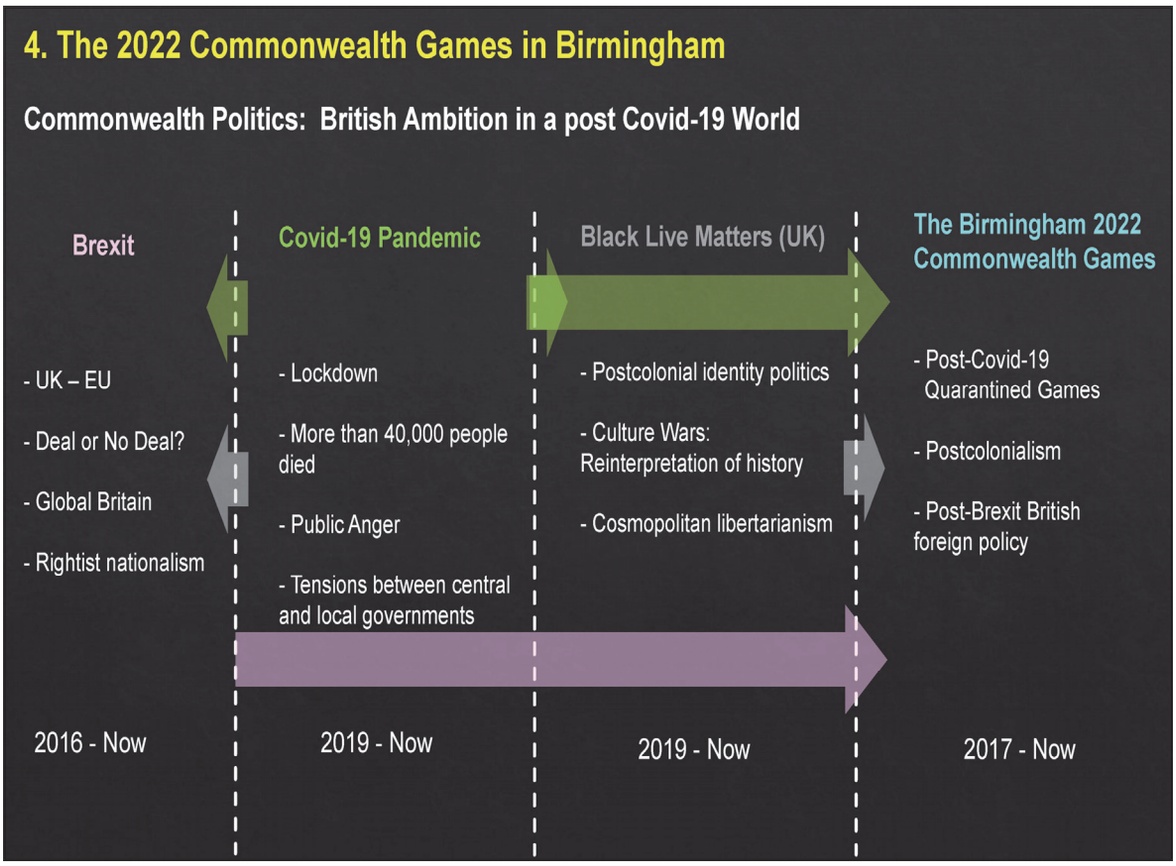
1. The Present Time
2. The 2020(1) Summer Olympics in Tokyo
3. The 2022 Winter Olympics in Beijing
4. The 2022 Commonwealth Games in Birmingham
5. The Forthcoming Time

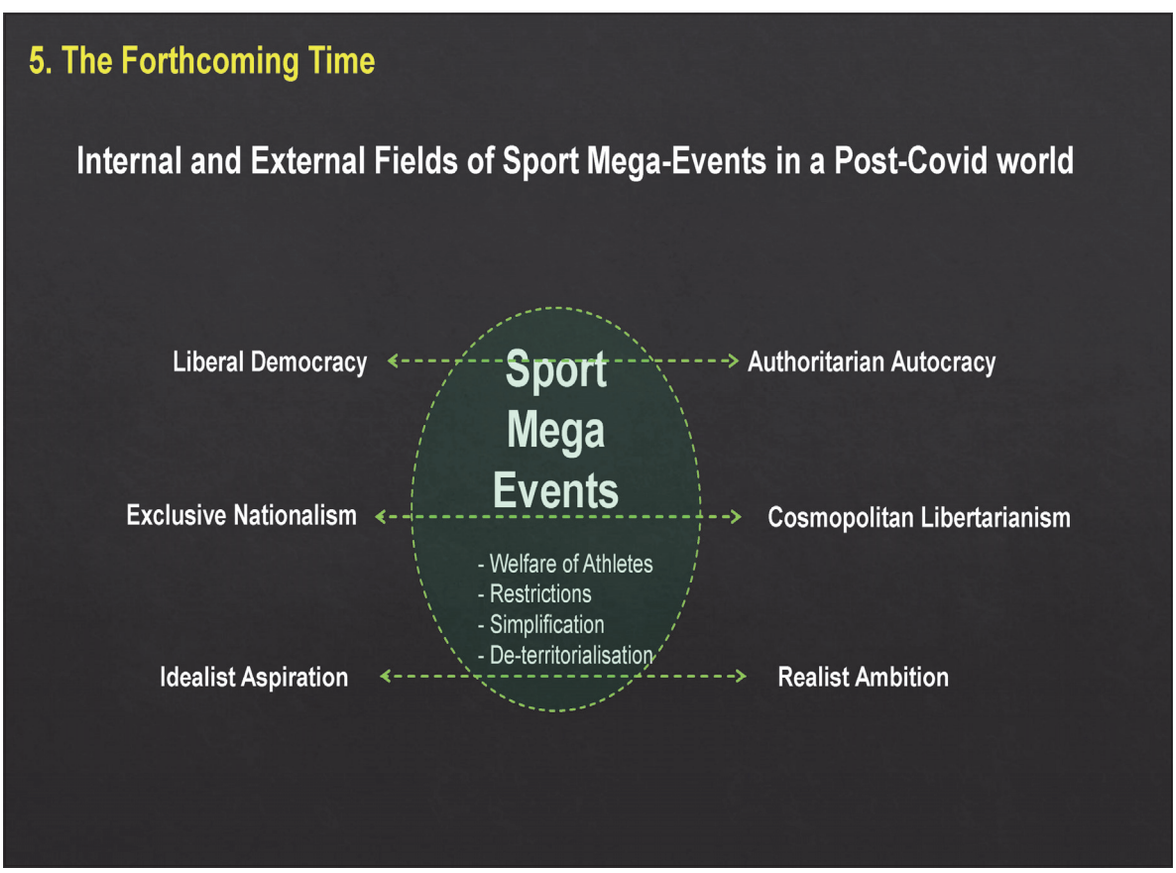

1. The Present Time
International System and Sport Mega-Events
Multipolarity
The Balance of Power
Britain, France, Russia, Prussia, Austro-Hungary
A Fragile system
The Foundation of the IOC and FIFA
Bipolarity
The Cold War
US and Soviet Union
Paradoxical Stability
The Politicisation of International sporting Competitions
Unipolarity
American Hegemony
Neoliberal World Order
Globalisation
Interdependency
The Commercialisation of Sport Mega-Events
Bipolarity (?)
The Rise of China
New Cold-War (?)
De-Globalisation (?)
Unilateralism
Protectionism
Covid-19 Pandemic
Risk, Uncertainty and Sport Mega-Events
The early 20th century
1945- 1991
1991- the mid 2010s
From 2019 onwards


1. The Present Time
Two Different Scenarios
A:
Less Political Sport Mega-Events
- A simplified ceremonies (No "Parade of Nation")
- Limited international travel (the absence of international leaders)
- Sport and athlete centred competitions
B:
More Political Sport Mega-Events
- The fragility of neoliberal world order
- The rise of nationalism (vaccine nationalism)
- Propaganda, Boycotts, and Interference


2. The 2020(1) Summer Olympic Games in Tokyo
Regional Politics:
Japan-South Korea Rivalry in (post) Covid-19 world
The legacy of Japanese colonialism (1945 onwards)
The cause of the uneasy relations
The recent Japan-Korea trade dispute (2019 ongoing)
The worsening Korea-Japan Relations
The outbreak of Covid-19 in Korea (and Japan) (Early 2020)
The additional diplomatic complexity
Anti-Tokyo 2020 Campaign in Korea (2019-2020)
Anti-Japanism In Korea
The postponement of Tokyo 2020
Uncertainty


3. The 2022 Winter Olympic Games in Beijing
Global Politics: The escalating tensions between US and China in post-Covid World
CHINA
USA
Increasing influence
One Belt One Road
Made in China 2025
Covid-19: Vaccine Nationalism
Winter Olympic Boosterism
Hegemony being challenged
Indo-Pacific Strategy
America First
Covid-19: "China Virus"
Winter Olympic Boycott (?)


4. The 2022 Commonwealth Games in Birmingham
Commonwealth Politics: British Ambition in a post Covid-19 World
Brexit
- UK – EU
- Deal or No Deal?
- Global Britain
- Rightist nationalism
2016 - Now
Covid-19 Pandemic
- Lockdown
- More than 40,000 people died
- Public Anger
- Tensions between central and local governments
2019 - Now
Black Live Matters (UK)
- Postcolonial identity politics
- Culture Wars: Reinterpretation of history
- Cosmopolitan libertarianism
2019 - Now
The Birmingham 2022 Commonwealth Games
- Post-Covid-19 Quarantined Games
- Postcolonialism
- Post-Brexit British foreign policy
2017 - Now


5. The Forthcoming Time
Internal and External Fields of Sport Mega-Events in a Post-Covid world
Liberal Democracy
Authoritarian Autocracy
Sport Mega Events
Exclusive Nationalism
Cosmopolitan Libertarianism
- Welfare of Athletes
- Restrictions
- Simplification
- De-territorialisation
Idealist Aspiration
Realist Ambition

SESSION 02

2020
Global Sport Science
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5. The Effect of Exercise-Induced Apelin Secretion on Cognitive Function in Patients with Mild Cognitive Impairment

▸▸ Bae, Junhyun
(Seoul National University)

Presentation Title 5

The Effect of Exercise-Induced Apelin Secretion on Cognitive Function in Patients with Mild Cognitive Impairment

Bae, Junhyun (Seoul National University)

Several studies have examined the role of the protein apelin in both muscle/organ function and disease since its identification in 1998. The aim of this study was to determine the effect of resistance exercise on serum apelin levels and on cognitive function in patients with mild cognitive impairment. Blood samples were collected before and after 12 weeks of high- or low-speed resistance exercise training. We measured cognitive function (K-MMSE & MoCA-K), physical performance (SPPB), isokinetic contraction (60° & 180° contraction and flexion), and serum apelin levels in 29 subjects who underwent either a high- or low-speed elastic band exercise regimen. We observed a positive correlation between eccentric contractions and cognitive function. In addition, both physical performance and cognitive function were improved in the exercise group. We also observed increased serum apelin levels after both high- and low-speed resistance exercise, which were positively correlated with increased cognitive function. Serum apelin levels, therefore, correlate with eccentric muscular contractions and increased cognitive function. The serum apelin is able to improve cognitive function in patients with mild cognitive function impairment.

Keywords: apelin, resistance exercise, cognitive function, mild cognitive impairment

The Effect of Exercise-Induced Apelin Secretion on Cognitive Function in Patients with Mild Cognitive Impairment

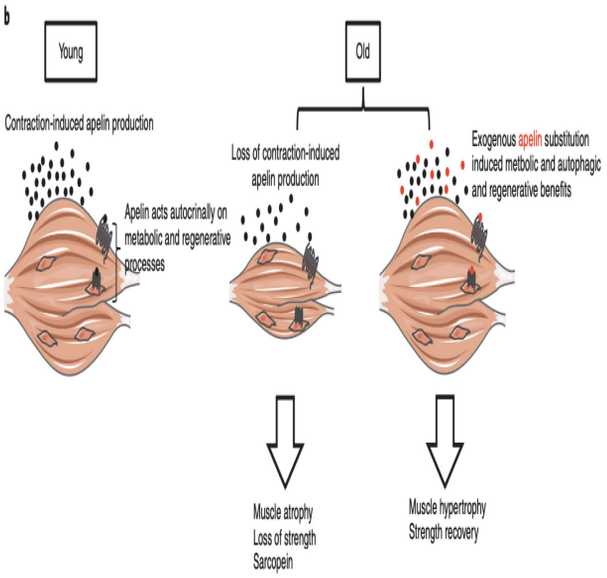
Jun Hyun Bae[1], Seong Eun Kwak[2], Sung Chun Cho[2], Didi Zhang[1], Chaeyoung Shin[1], Byunggul Lim[1], and Wook Song[1,3,*]

[1]Health and Exercise Science Laboratory, Institute of Sport Science, Seoul National University, Seoul, Republic of Korea
[2]Well Aging Research Center, Daegu Gyeongbuk Institute of Science & Technology (DGIST), Daegu, Republic of Korea
[3]Institute of Aging, Seoul National University, Seoul, Republic of Korea

Introduction

Introduction – What is apelin?

- Muscle Contractions, which occur du ring exercise, increase the release of molecules called myokines [1]
- Though many myokines have been discovered [2], studies suggest that t he exercise-induced release of the a pelin specifically slows biological agi ng [3,4] and improves metabolism [5].



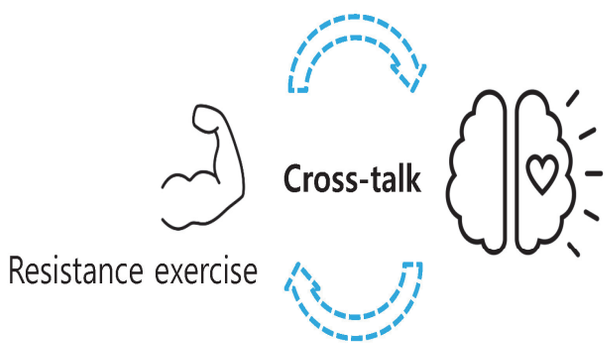
(***Nat Med***, "The exerkine apelin reverses age-associated sarcopenia", **2018**)

Introduction – Exercise-induced Apelin Affect…

- Exercise-induced release of apelin has many physiological benefits, specially reducing adipose tissue [6], reducing arterial stiffness [7], and improving metabolic syndrome f actors [8], TNF-alpha, and Insulin [9].
- A 12 week aerobic exercise training improved metabolic function and cardiovascular capacity in overweight patients with T2DM. [10]
- A 8 weeks of endurance exercise in obese non–diabetic male increased muscular ape lin expression [11]
- A 8 weeks aerobic exercise increased plasma apelin levels and reduced arterial stiffne ss in middle-aged and older adults (>65 years old) [7]

Introduction – Exercise-induced Apelin and cognitive function

- Exercise-induced apelin released increased both skeletal muscle function and cogniti ve function in aged mice [12]
- Another study showed apelin prevented neuronal death by reducing inflammatory m ediators (Iterleukin-1B & tumor necrosis factor alpha) in AD [13]



Purpose & Hypothesis

- it remains unclear whether exercise-induced apelin secretion improves cognitive func tion [14].
- This study examined that whether resistance exercise-induced apelin secretion affect ed cognitive function in patients with mild cognitive impairment. Previous studies ha ve observed a positive correlation between physical performance and cognitive funct ion [15,16].
- ***The hypothesis of study was therefore that 12 weeks of resistance exercise woul d improve physical and cognitive function, and increase serum apelin levels, in p atients with mild cognitive impairment.***

Method

Methods – Subjects

- Inclusion (n = 29)

A score between 20-24 points on the Korean Mini-Mental State Examination (K-MMSE) and a score of less than 23 points on the Korean Montreal Cognitive Ass essment (MoCA-K) test.

Subjects had to be able to walk 10-m walking without aid and have a history of doing irregular exercise.

- Exclusion (n = 5)

Unstable related to CVD, cerebrovascular disease, musculoskeletal impairment or psychiatric/neurological disorders.

All subjects were randomly assigned

Methods – Subjects

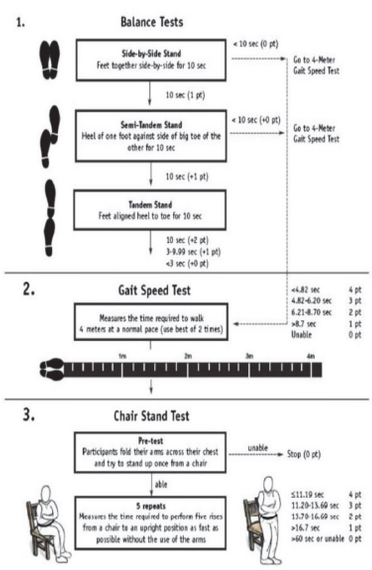
- 2 different types of exercise groups (n = 29)
- The improved group (N = 16, Physical performance: SPPB>8, cognitive F unction: K-MMSE≥24)

- The cognitive decline or steady group (N = 13, Physical performance: SP PB>8, cognitive function: K-MMSE<24).

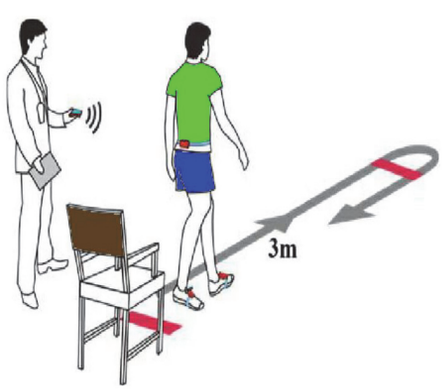
Serum apelin levels and cognitive function were measured before and after 12 weeks of exercise to analyze which type of exercise resulted in the greate st improvement.

Methods – Measurements

Body composi tion



SPPB



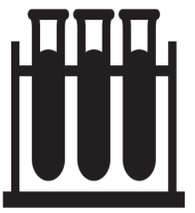
Time up & go test

Methods – Measurements

Isokinetic Lower & leg Muscle Strength

Grip Strength

Cognitive Function Test (MMSE & MoCA)



Serum Apelin & other blood markers

Methods – 12 wks of Exercise Program

12 weeks of Elastic band exercise

- 10 minutes of warm-up training + 40 minutes of elastic band training + 10 minutes of cool-down training

	Slow-speed Group	High-speed Group
Exercise Type	Blue color band (high)	Green color band (very low)
Exercise Intensity	15-16 RPE (hard)	12-13 RPE (somewhat hard)
Exercise Time & Duration	2-3 sets of 8-10 repetitions	2-3 sets of 12 -15 repetitions
Exercise methods	> 2 sec the concentric contraction phase, 1 sec pause, > 2 sec eccentric contraction phase	Maintain 1 sec pause, followed by a 1 sec pause and then > 2 sec an eccentric contraction phase

Methods – Statistical Analysis

- All variables, including body composition, blood profile, physical performance, and cognitive function were expressed as mean (M) and standard deviation (SD).
- After the normality test, a paired sample t-test was used to analyze pre-and post-exercise variables in both the improved group and cognitive decline or steady group. The paired sample t-test was also used to analyze pre-and post-exercise variables after exercise between high- and slow-speed exercise groups.
- Pearson's correlation analysis to examine the correlation between serum apelin, cognitive function, and isokinetic contraction. We used a = .05 for all statistical thresholds in this study.

Results

Table 1: The Basic Characteristics of Subjects between both the Improved and the Cognitive Function Decline or Steady Group

	Both Improved (N = 16)		Cognitive Function Decline or Steady (N = 13)		Mean Difference of 95% CI				
(mean ± SD)	Before	After Exercise	Before	After Exercise	Before Total	After Total	t (df)	Lower	Upper
Age (years)		74.25 (3.61)		74.92 (3.30)	74.55 (3.43)	74.55 (3.43)	-.52 (27)	-3.33	1.99
Height (cm)	151.29 (6.01)	150.74 (5.63)	150.85 (5.33)	150.66 (5.22)	150.85 (5.33)	150.66 (5.22)	.04 (27)	-4.10	4.25
Weight (kg)	57.11 (7.90)	56.92 (7.76)	56.61 (7.40)	56.18 (7.19)	56.88 (7.55)	56.59 (7.38)	.26 (27)	-5.02	6.49
BMI (kg/m^2)	24.95 (3.18)	24.98 (2.83)	24.84 (2.53)	24.72 (2.49)	24.9 (2.86)	24.87 (2.64)	.27 (27)	-1.79	2.33
Waist Hip Ratio	.89 (.05)	.89 (.04)	.87 (.07)	.86 (.05)	.88 (.06)	.87 (.04)	1.52 (27)	-.01	.06
Skeletal Muscle Mass (kg)	18.89 (2.67)	19.17 (2.49)	19.14 (3.19)	19.46 (2.64)	19.00 (2.86)	19.3 (2.51)	-.31 (27)	-2.25	1.66
Body Fat (%)	37.18 (7.20)	36.2 (6.28)	35.82 (8.70)	34.45 (5.86)	36.57 (7.79)	35.41 (6.05)	-2.92 (27)	-2.92	6.43
Glucose	104.00 (34.10)	104.81 (28.01)	99.23 (23.09)	99.77 (18.47)	101.86 (29.28)	102.55 (23.94)	.56 (27)	-13.53	23.61
Total Cholesterol	187.88 (50.95)	184.00 (41.06)	192.85 (36.46)	174.92 (33.50)	190.10 (44.35)	179.93 (37.49)	.64 (27)	-19.95	38.10
Triglyceride	138.63 (55.62)	123.38 (53.04)	135.92 (74.30)	111.38 (43.05)	137.41 (63.44)	118.00 (48.36)	.66 (27)	-25.44	49.42
LDL	123.13 (34.54)	111.94 (35.66)	113.08 (38.07)	102.15 (29.73)	118.62 (35.87)	107.55 (32.93)	.79 (27)	-15.62	35.18
HDL	53.00 (9.40)	48.63 (10.69)	60.23 (19.07)	51.77 (14.68)[a]	56.24 (14.72)	50.03 (12.49)	-.67 (27)	-12.81	6.52
Apelin (ng/mL)	.90 (.05)	1.01 (.07)[a]	.92 (.05)	.94 (.09)	.91 (.05)	.98 (.08)	2.53 (27)*	.01	.13
Grip Strength (N)	19.36 (3.30)	23.89 (4.02)[a]	17.35 (2.85)	21.07 (2.67)[a]	18.46 (3.22)	22.62 (3.71)	2.17 (27)*	.15	5.29
SPPB total score (0-12)	8.88 (1.78)	11.25 (1.13)[a]	7.92 (1.38)	10.69 (.95)[a]	8.45 (1.66)	11.00 (1.07)	1.42 (27)	-.25	1.36
Time to Up-and-Go (sec)	9.95 (1.47)	8.73 (.85)[a]	10.51 (1.28)	9.15 (.68)[a]	10.20 (1.39)	8.92 (.79)	-1.44 (27)	-1.02	.18
K-MMSE (score)	21.25 (1.06)	25.93 (1.22)[a]	21.78 (2.91)	23.50 (2.11)	22.24 (2.71)	25.14 (2.26)	3.76 (25)***	.84	3.85
MoCA (score)	18.87 (2.92)	24.54 (2.82)[a]	18.91 (3.02)	19.00 (5.66)	18.17 (3.52)	22.31 (4.44)	3.01 (19)***	-2.47	2.38

Figure 1: The Correlation on Serum Apelin Level between Isokinetic Contraction and Cognitive Function

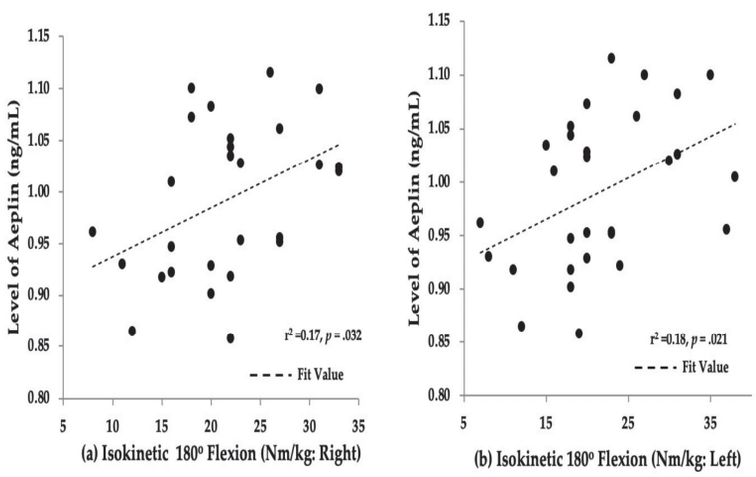


Figure 1. Correlation between serum apelin and isokinetic contraction: (a) correlation between isokinetic right 180^° flexion and serum apelin level; (b) correlation between isokinetic left 180^° flexion and serum apelin level.

Figure 2: The Correlation on Serum Apelin Level between Isokinetic Contraction and Cognitive Function

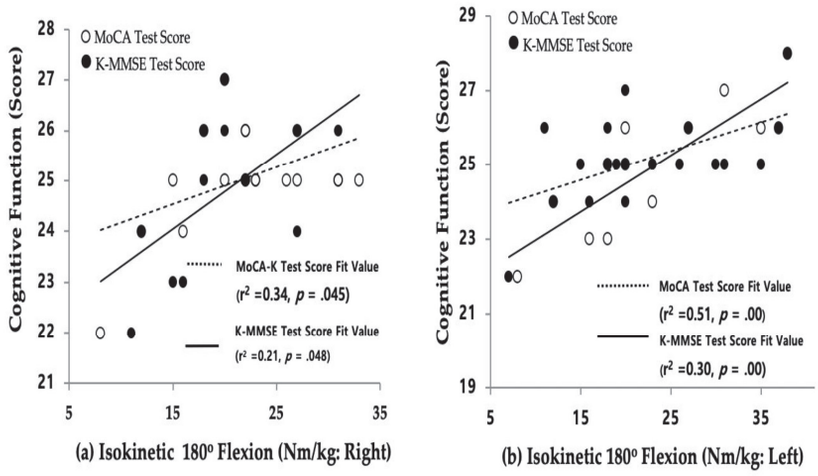
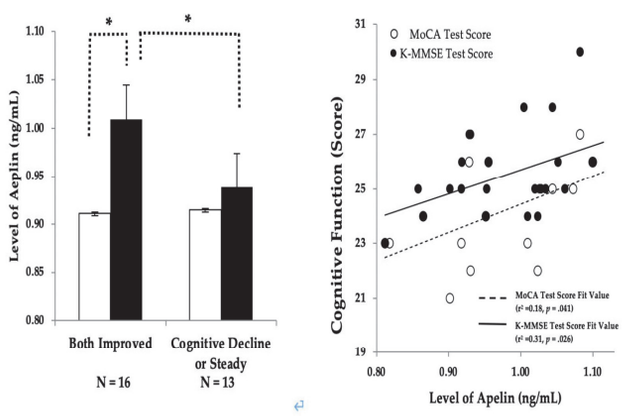


Figure 2. Correlation between cognitive function (K-MMSE & MoCA-K) and isokinetic contraction: (a) correlation between isokinetic right 180 ^° flexion and cognitive function (K-MMSE & MoCA-K); (b) correlation between isokinetic left 180^° flexion and cognitive function (K-MMSE & MoCA-K). * = p < .05

Figure 3: The Effect of Cognitive Function and Serum Apelin Level on Both Physical Performance and Cognitive Impr ovement



(a) Differences in Apelin Levels between the Both Improved and Cognitive Decline or Steady Group

(b) Correlation between level of Apelin Levels and Cognitive Function

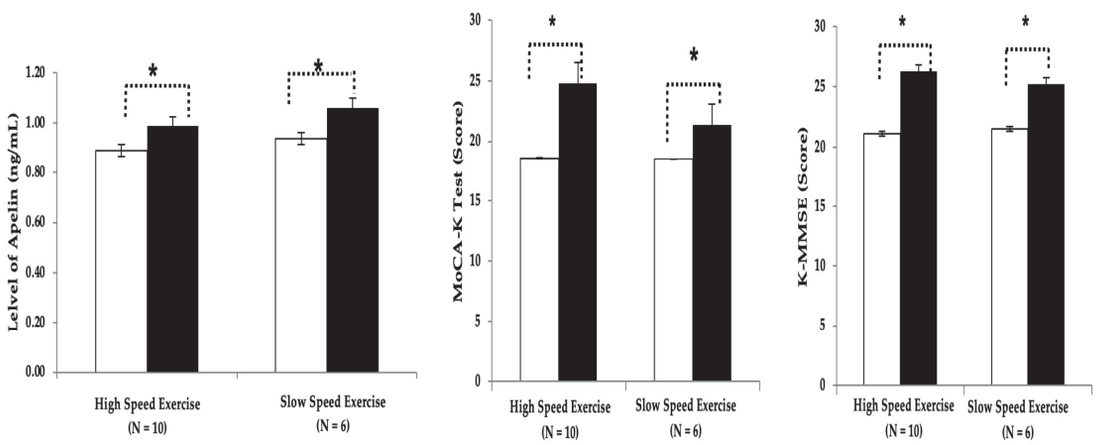
Figure 3. Differences in apelin levels and cognitive function (K-MMSE & MoCA-K) across experimental grou ps: (a) different level of apelin between both improved group and cognitive decline or steady group; (b) a correlation level of apelin and cognitive function (K-MMSE & MoCA-K). * = p < .05

Table 2: Isokinetic Contraction Differences between the Both Improved and the Cognitive Decline or Steady Groups

Isokinetic Contraction (Nm/kg)	Both Improved (N = 16)		Cognitive Function Decline or Steady (N = 13)				95% CI		d
(mean ± SD)	Before	After	Before	After	After Total	t (df)	Lower	Upper	
60° Right Extension	57.79 (16.24)	67.71 (18.22)[a]	57.00 (22.60)	62.00 (16.68)	65.10 (16.72)	.58 (27)	58.74	71.46	.22
60° Right Flexion	35.93 (12.95)	38.60 (6.32)	36.00 (8.90)	36.17 (11.87)	37.52 (7.00)	.89 (25)	34.75	40.29	.35
60° Left Extension	56.27 (11.87)	62.33 (12.58)[a]	52.92 (14.82)	61.69 (14.85)[a]	62.04 (13.42)	.12 (26)	56.83	67.24	.05
60° Left Flexion	36.56 (9.77)	37.81 (9.17)	36.31 (10.70)	35.62 (9.87)	36.83 (9.38)	.62 (27)	33.26	40.40	.23
180° Right Extension	32.00 (8.07)	38.53 (7.42)[a]	30.69 (12.37)	38.92 (10.34)[a]	38.71 (8.73)	-.12 (26)	35.22	42.10	-.04
180° Right Flexion	25.56 (8.48)	23.88 (6.82)	24.83 (9.74)	20.08 (8.03)	22.25 (7.47)	1.35 (26)	19.35	25.15	.20
180° Left Extension	33.44 (8.04)	38.75 (8.99)[a]	29.85 (9.70)	35.54 (9.68)[a]	37.31 (9.28)	.92 (27)	33.78	40.84	.34
180° Left Flexion	25.06 (9.38)	23.31 (6.96)	24.92 (7.79)	20.92 (8.02)[a]	22.24 (7.41)	.86 (27)	19.42	25.06	.35

[a] The statistical differences between before and after 12 weeks of exercise in each groups (p < .05); * = p < .05; ** = p < .01; *** = p < .001; d = effect size

Figure 4: The Differences of Serum Apelin Level and Cognitive Function on Different Exercise Type in Both Physical Performance and Cognitive Function Better Group



(a) Level of Apelin Differences between High Speed and Slow Speed

(b) Differences of MoCA-K test scores between high-and slow-speed exercise group

(c) Differences of K-MMSE test scores between high-and slow-speed exercise group

Figure 4. Difference between apelin levels and cognitive function (K-MMSE & MoCA-K) before and after exercise in both high- and slow-speed exercise group: (a) apelin levels between both high- and slow-speed exercise groups; (b) K-MMSE test scores between high- and slow-speed exercise; (c) MoCA-K test scores between high- and slow-speed exercise. * = p < .05

Discussion

Resistance Exercise improved cognitive function in MCI

- **We observed that in the both improved group, which was defined by the improvement of both physical function and cognitive function, 12 weeks of resistance elastic band training increased serum apelin levels and was positively correlated with K-MMSE and MoCA-K test scores (Figure 3-a & b) in patients with mild cognitive impairments.**
  - This results is consistent with previous studies suggesting that apelin is a potential mediator of exercise on improved cognitive function in old mice [12]
- **The possible of mechanisms of apelin can be explained by apelin-13 upregulates BDNF/TrkB pathways against cognitive deficit in STZ-induced rat model of Alzheimer's Disease (AD) [17]. In addition, one study found that physical exercise reduced AD [18]**
  - Our findings can imply that resistance exercise-induced apelin secretion improved cognitive function in patients with MCI through systemic circulatory system and decreased apelin levels may be feature of neurodegenerative disease.

Eccentric Contraction Type of Resistance Exercise was positive cor related Apelin and Cognitive Function

- The result supported that resistance exercise to improve both cog nitive function and muscle function [19, 20]
- It also explained that muscular strength and muscle function (e.g., physical performance) have been linked to cognitive function in A D [21]
- Our findings help build a more detailed understanding of how dif ferent muscular contraction types affect cognitive function.

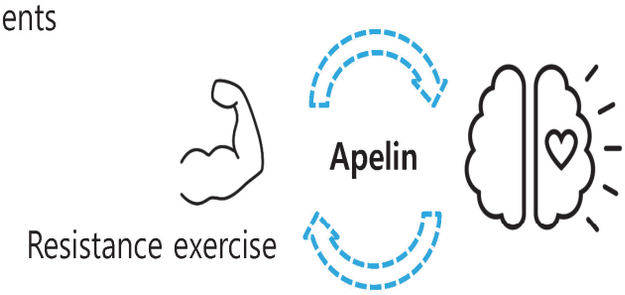
Resistance exercise itself has increased executive cogn itive ability in MCI

- Our results show that resistance exercise itself improved cognitive function by increasing the Apelin levels.
- These results were consistent with studies showing that exercise-i nduced increases in apelin levels affected cognitive function [12]

Conclusion

The Benefit between Exercise-induced Apelin & Cognitive Function

- The Resistance exercise not only increased muscle strength but also cognitive function.
- It played a positive role in improving cognitive function via increasing serum apelin level.
- Therefore, the serum apelin is possible to improve cognitive function in MCI patients



Thank you for Your Attention

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SESSION 02

2020
Global Sport Science
Virtual Conference

6. Exploring the Coordination process and Education Logics on the Qualification Training System for Level 2 -Life-Sports-Coach through Institutional Ethnography

▸▸ Ryou, Ju-young
(Seoul National University)

Presentation Title 6

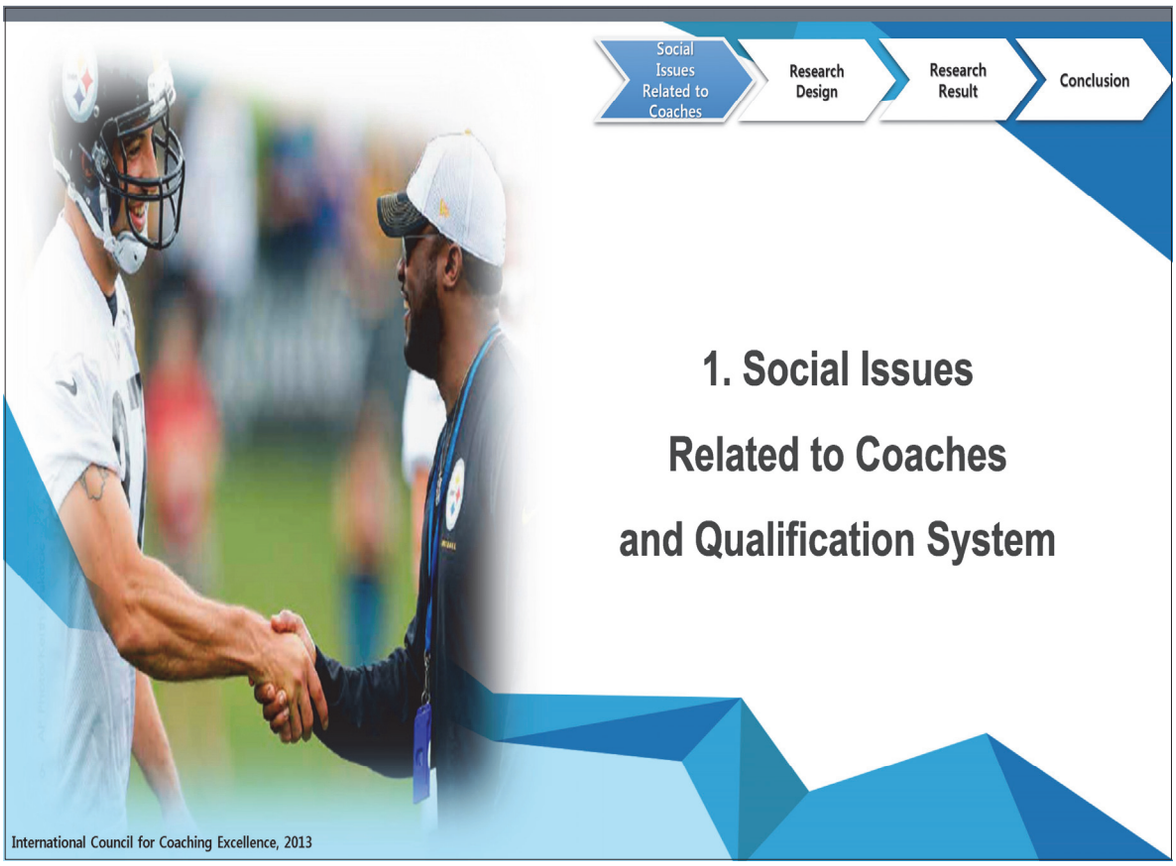
Exploring the Coordination process and Education Logics on the Qualification Training System for Level 2-Life-Sports-Coach through Institutional Ethnography

Ryou, Ju-young (Seoul National University)

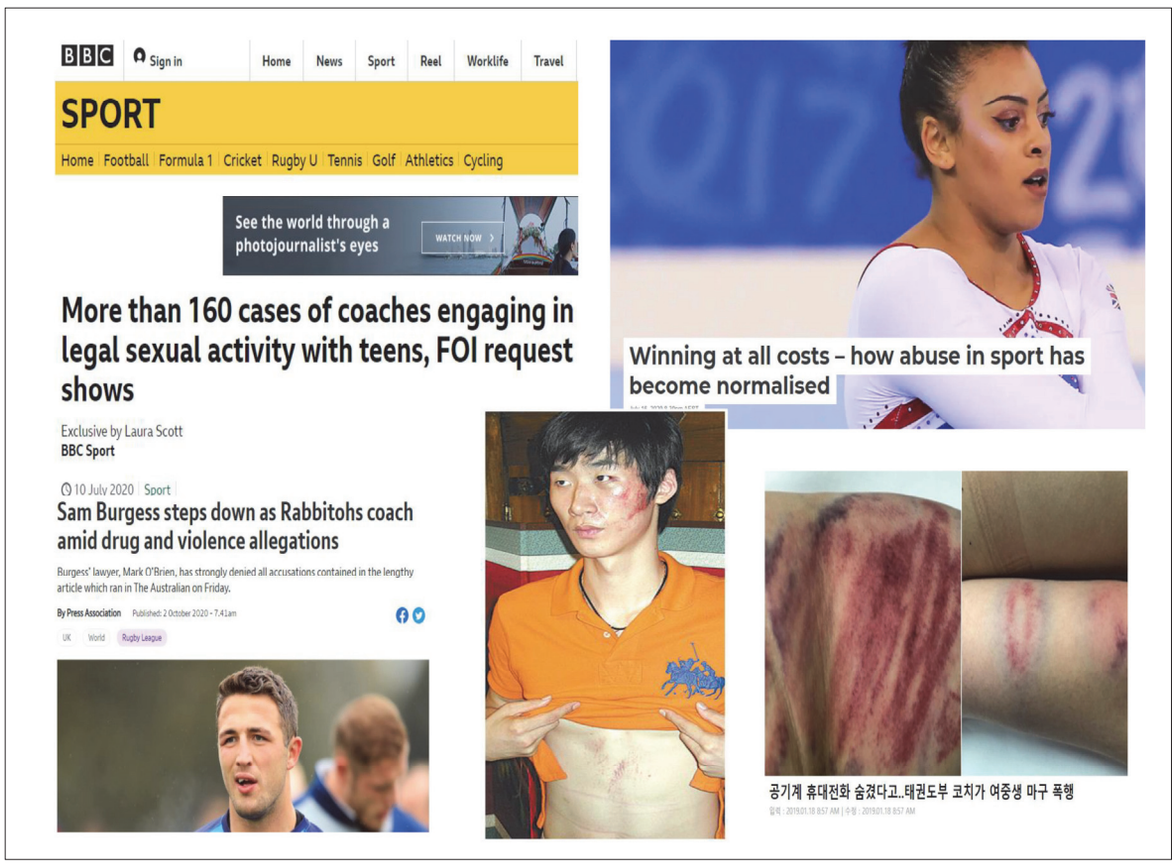
The purpose of this study was to identify the light and shade of the educational logic underlying the certificate courses of level 2 life-sport-coach in South Korea and to seek its alternative direction by understanding the points of coordination process between participants' experience and institutional texts in the qualification system. To this end, 'institutional ethnography(Smith. 1980)' was adopted. Eight qualified coaches who participated in the certificate curriculum after '2015 system revision' were selected as cases. The data were collected through interviews, institutional reports and non-participatory observation. These data were analyzed by 'collecting' the difference pieces and 'drawing' the coordination process between empirical languages and institutional texts in the social organization map. The findings are as follows. First, participants recognized the curriculum of the qualification system as 'unlinked content', 'passive activities' and 'unsystematic operation' unlike the institutional text. Second, according to 'the social organization map', the current certificate system is based on two educational logics('performance pedagogy' and 'craft pedagogy'). Also, the system closely shared the characteristics and limitations of the two logics. Third, to ease the limitations of the existing qualification system, 'reflective pedagogy(Schon, 1983; 1987)' and specific measures were proposed as an alternative direction. Furthermore, the need for a follow-up discussion to critically examine the pros and cons of various educational logics on the certificate curriculum was suggested. The findings are expected to provide useful implications for alleviating the gap between the field situation and institutional texts in a more constructive way.

Exploring the Coordination process and Education Logics on the Qualification Training System for Level 2-Life-Sports-Coach through Institutional Ethnography

Contents


Social Issues Related to Coaches
Research Design
Research Result
Conclusion
1. Social Issues
Related to Coaches
and Qualification System
International Council for Coaching Excellence, 2013


Abusive Actions of Some Coaches
Social Issues Related to Coaches
Research Design
Research Result
Conclusion
출처: 블루복스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BBC Sport
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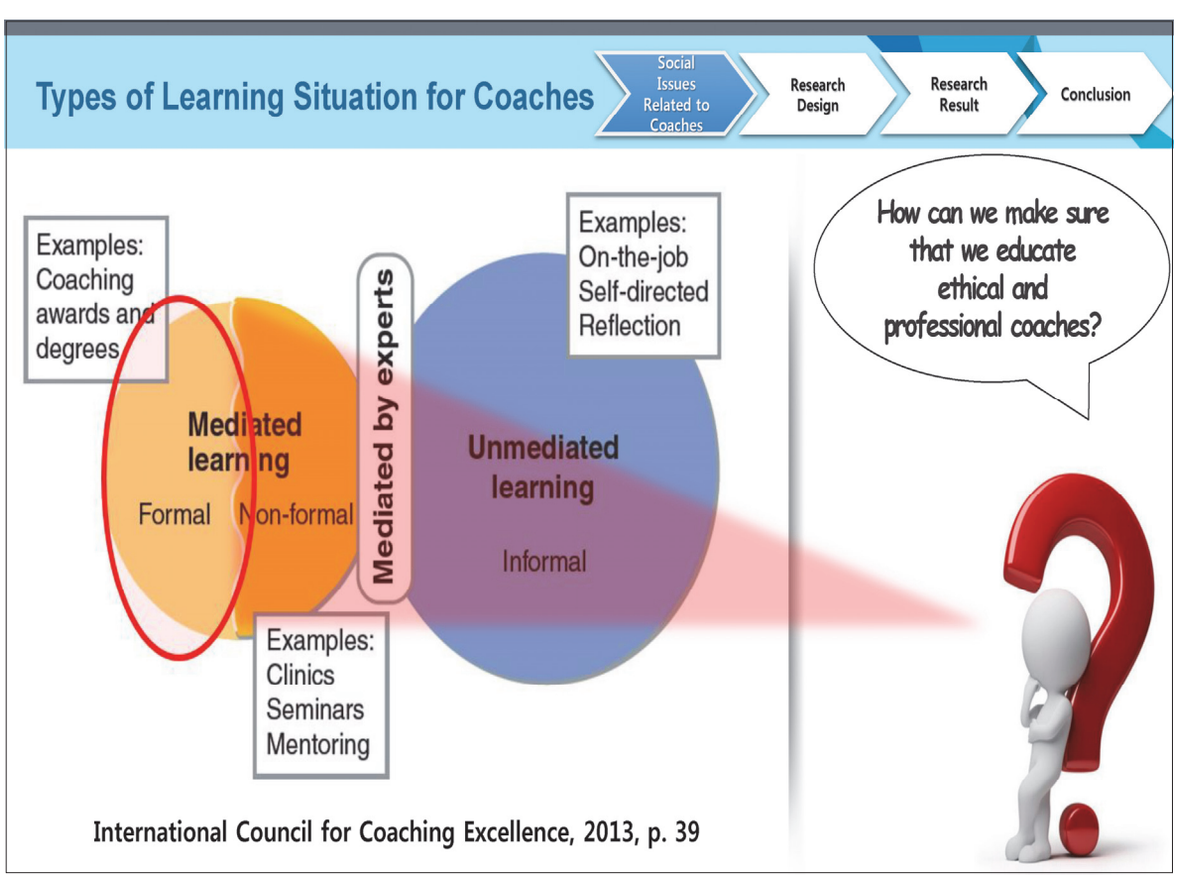
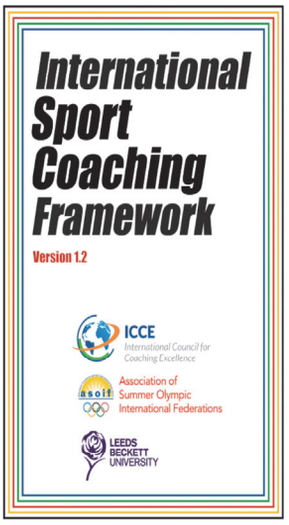
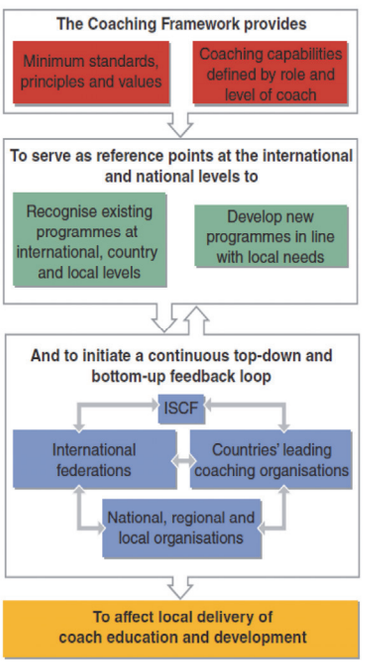
공기계 휴대전화 숨겼다고..태권도부 코치가 여중생 마구 폭행


Types of Learning Situation for Coaches
Social Issues Related to Coaches
Research Design
Research Result
Conclusion
Examples: Coaching awards and degrees
Mediated learning
Formal
Non-formal
Mediated by experts
Examples: On-the-job Self-directed Reflection
Unmediated learning
Informal
Examples: Clinics Seminars Mentoring
How can we make sure that we educate ethical and professional coaches?
International Council for Coaching Excellence, 2013, p. 39

Coaching Framework and Standard



Coaching frame work, Category and Domain

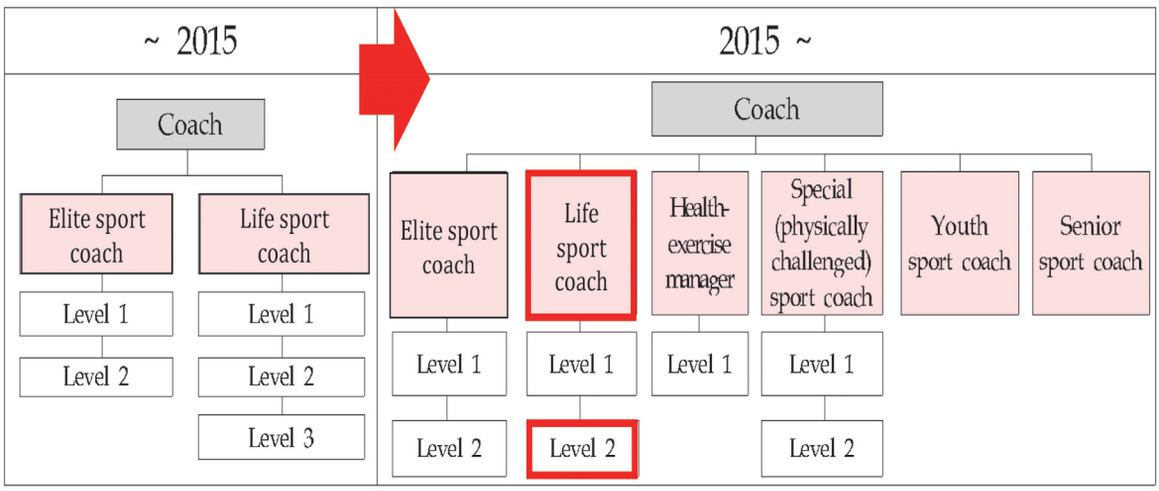


Coaching roles	Achievement standards		
	National and international federation levels	University/ higher education awards	Other coach education institution and agency awards
Master/Head Coach	Level 4	University degree or postgraduate degree	
Advanced/ Senior Coach	Level 3	University diploma or degree	
Coach	Level 2		Coaching certificate
Coaching Assistant	Level 1		Coach introductory course award

(International Council for Coaching Excellence, 2013, p. 11, 23, 45)

South Korea's Coach Certification System

- **Certification system**: Segmentation by field of coaching and age of subject based on life cycle



Sports ex) Soccer + Life-sport coach + Level 2 = Soccer Life-sport-coach Level 2 certification

Why should we focus on the Level 2 life-sport coach: 1. statistical information

- Statistical information on the number of certifications acquired in 2019 by Korea Sports Promotion Foundation

year	total	Health-exercise manager	Elite sport coach Level 1	Elite sport coach Level 2	Life sport coach Level 1	Life sport coach Level 2	Youth sport coach	Senior sport coach	Special (physically challenged) sport coach Level 1	Special (physically challenged) sport coach Level 2
2019	16618	235	48	1813	258	10177	2003	15	15	693

62%

* Highest Demand and Supply
Most number of participants and the issuance of the most certificate

= They play a crucial role as a person in charge of health and sports for the majority of the people.

Why should we focus on the Level 2 life-sport coach: 2. Government / University Institution's support

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

Universities' Education System

Ministry of Culture, Sports and Tourism, 2018

Department Name	N	Student number		
		T	M	W
관광레저스포츠계열	1	302	268	34
관광레저스포츠과	1	73	66	7
레저스포츠계열	3	25	25	-
레저스포츠과	18	1,320	976	344
레저스포츠전공	2	34	34	-
레저스포츠학과	6	378	290	88
사회체육과	21	1,526	1,318	208
사회체육전공	1	3	3	-
사회체육학과	1	30	14	16
생활스포츠과	1	15	14	1
생활스포츠학과	1	2	2	-
생활체육과	12	1,243	869	374
생활체육학과	3	83	50	33

About 5,000 university students major in daily life sports to become coaches or get related jobs.

Government Organizations' Support for Certification System

KSPO 국민체육진흥공단

문화체육관광부 대한체육회 Korean Sport & Olympic Committee

Sport for All (from youth to senior)

Recognizing the importance of sports activities and health for each life cycle of the entire nation, the government and university education institutions have worked hard to secure participation(daily life) sports coaches' basic expertise.

Why should we focus on the Level 2 life-sport coach: 3. doubts about coach's professionalism

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

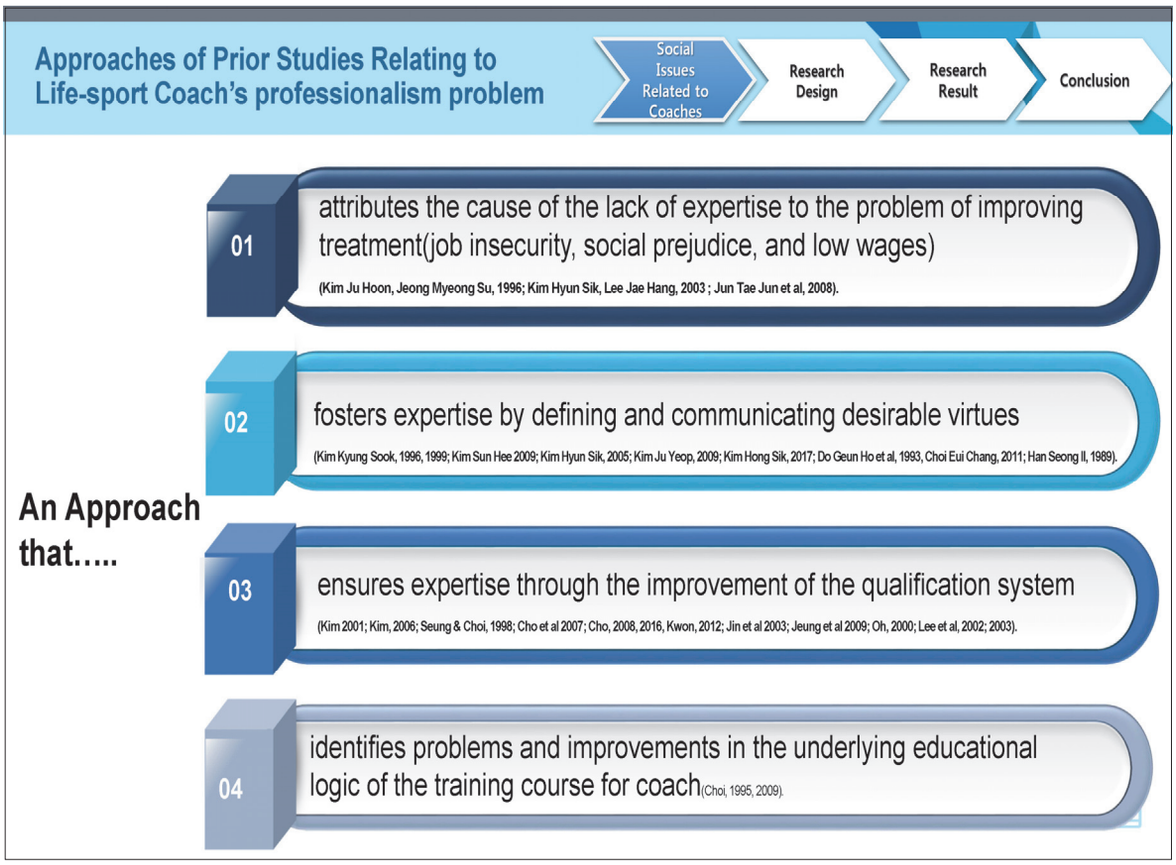
(Oh my News, 2018)

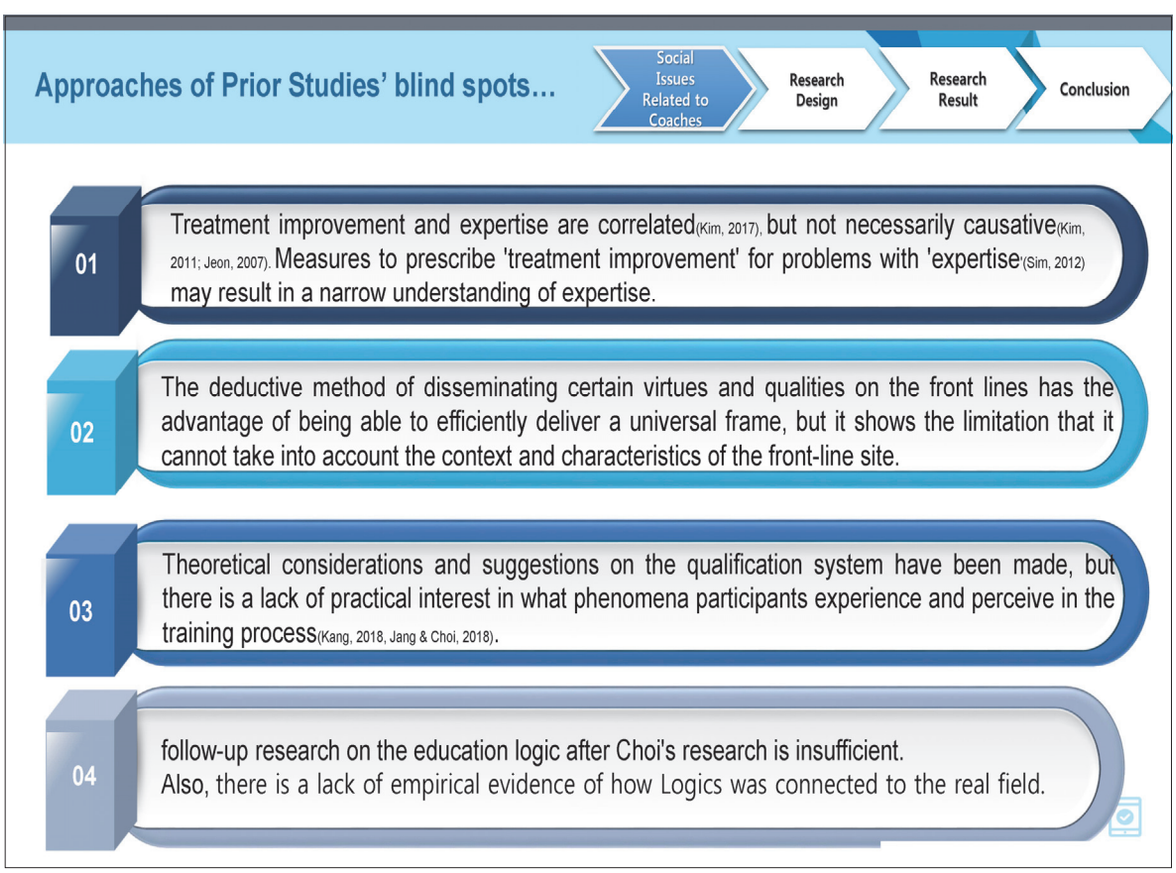
Social Distrust' doubting the Professionalism of Sports Instructors

(Kim, 2005; Kim, 2003, 2004; Park, 2011).

Considering that there is a distrust that doubts professionalism as shown in the previous example, why are the majority of sport coaches unable to demonstrate their competence as professionals, even though they have received professional training (Kwon, 2007), and national qualifications (Lee et, 2002)?

출처 : 더미래연구소


Approaches of Prior Studies Relating to Life-sport Coach's professionalism problem
Social Issues Related to Coaches
Research Design
Research Result
Conclusion
An Approach that.....
01
attributes the cause of the lack of expertise to the problem of improving treatment(job insecurity, social prejudice, and low wages)
(Kim Ju Hoon, Jeong Myeong Su, 1996; Kim Hyun Sik, Lee Jae Hang, 2003 ; Jun Tae Jun et al, 2008).
02
fosters expertise by defining and communicating desirable virtues
(Kim Kyung Sook, 1996, 1999; Kim Sun Hee 2009; Kim Hyun Sik, 2005; Kim Ju Yeop, 2009; Kim Hong Sik, 2017; Do Geun Ho et al, 1993, Choi Eui Chang, 2011; Han Seong Il, 1989).
03
ensures expertise through the improvement of the qualification system
(Kim 2001; Kim, 2006; Seung & Choi, 1998; Cho et al 2007; Cho, 2008, 2016, Kwon, 2012; Jin et al 2003; Jeung et al 2009; Oh, 2000; Lee et al, 2002; 2003).
04
identifies problems and improvements in the underlying educational logic of the training course for coach(Choi, 1995, 2009).


Approaches of Prior Studies' blind spots...
Social Issues Related to Coaches
Research Design
Research Result
Conclusion
01
Treatment improvement and expertise are correlated(Kim, 2017), but not necessarily causative(Kim, 2011; Jeon, 2007). Measures to prescribe 'treatment improvement' for problems with 'expertise'(Sim, 2012) may result in a narrow understanding of expertise.
02
The deductive method of disseminating certain virtues and qualities on the front lines has the advantage of being able to efficiently deliver a universal frame, but it shows the limitation that it cannot take into account the context and characteristics of the front-line site.
03
Theoretical considerations and suggestions on the qualification system have been made, but there is a lack of practical interest in what phenomena participants experience and perceive in the training process(Kang, 2018, Jang & Choi, 2018).
04
follow-up research on the education logic after Choi's research is insufficient.
Also, there is a lack of empirical evidence of how Logics was connected to the real field.

Purpose and Questions of Research

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

Research Purpose

The purpose of this study was to identify the light and shade of the educational logic underlying the certificate courses and to seek its alternative direction by understanding the points of coordination process between participants' experience and institutional texts in the qualification system.

Research Questions

① What is the relationship between trainees' experience and institutional text?

② What are the characteristics and limitations of educational logic that flow at the base of the qualified training system?

③ what kind of alternative logic and measures can improve the limitation of the existing qualification system?

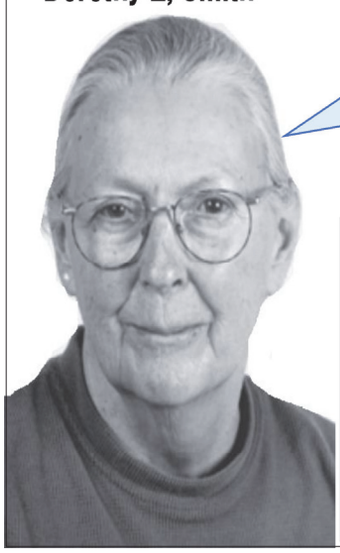
Expection Effect

The findings are expected to provide useful implications for alleviating the gap between the field situation and institutional texts in a more constructive way.

Research method: Institutional Ethnography

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

Dorothy E, Smith



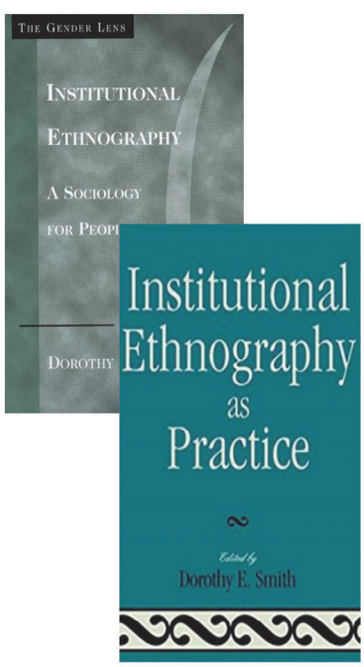
Institutional Ethnography is useful in academic fields related to human service professionals such as education, welfare, and health care. (Smith, 2005)

◎ While existing qualitative research methods tend to focus on micro phenomena in the life episodes, there is a risk of neglecting macroscopic backgrounds such as institutional, social and political context(Smith, 2005)

◎ Institutional ethnography is an effective way to reveal the dynamic network of individuals and institutions at a more specific level.
(Campbell & Gregor, 2004. Grahame, 1998).

Four Characteristics of Institutional Ethnography

Social Issues Related to Coaches | Research Design | Research Result | Conclusion



01 The interactive viewpoints: micro and macroscopic ones have their own self-independence and "adjust" each other.

02 There are some devices or concepts that connect individuals and institutions in a sophisticated way.
Ex) standpoint, difference, Coordination, Social organization and so on

03 It Focuses on describing phenomena rather than interpreting. By doing so one can understand the process of what is actually happening over the institutional language(DeVault & McCoy, 2006)

04 By visualizing and clarifying the points of practice, we can lay the foundation for institutional changes in the field.
(Kim, 2009).

Selection of Participants and Basic Information

Criterion Sampling Method
(Patton, 2015)

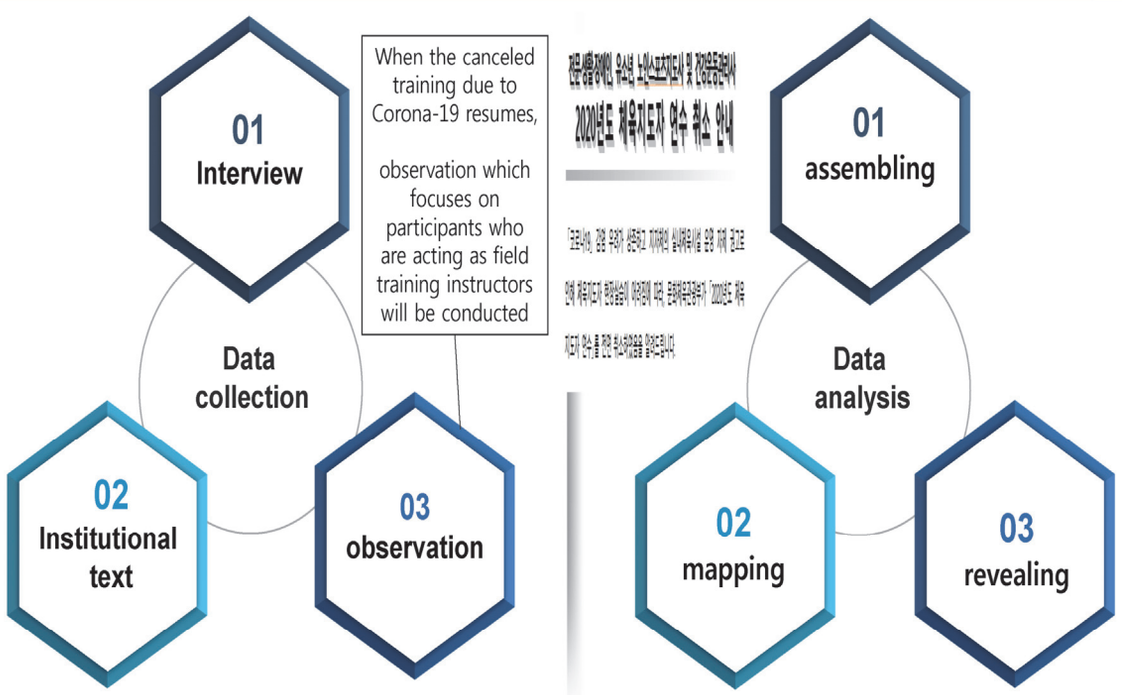
① Acquiring qualification after 2015

② Holding a degree in P.E related major

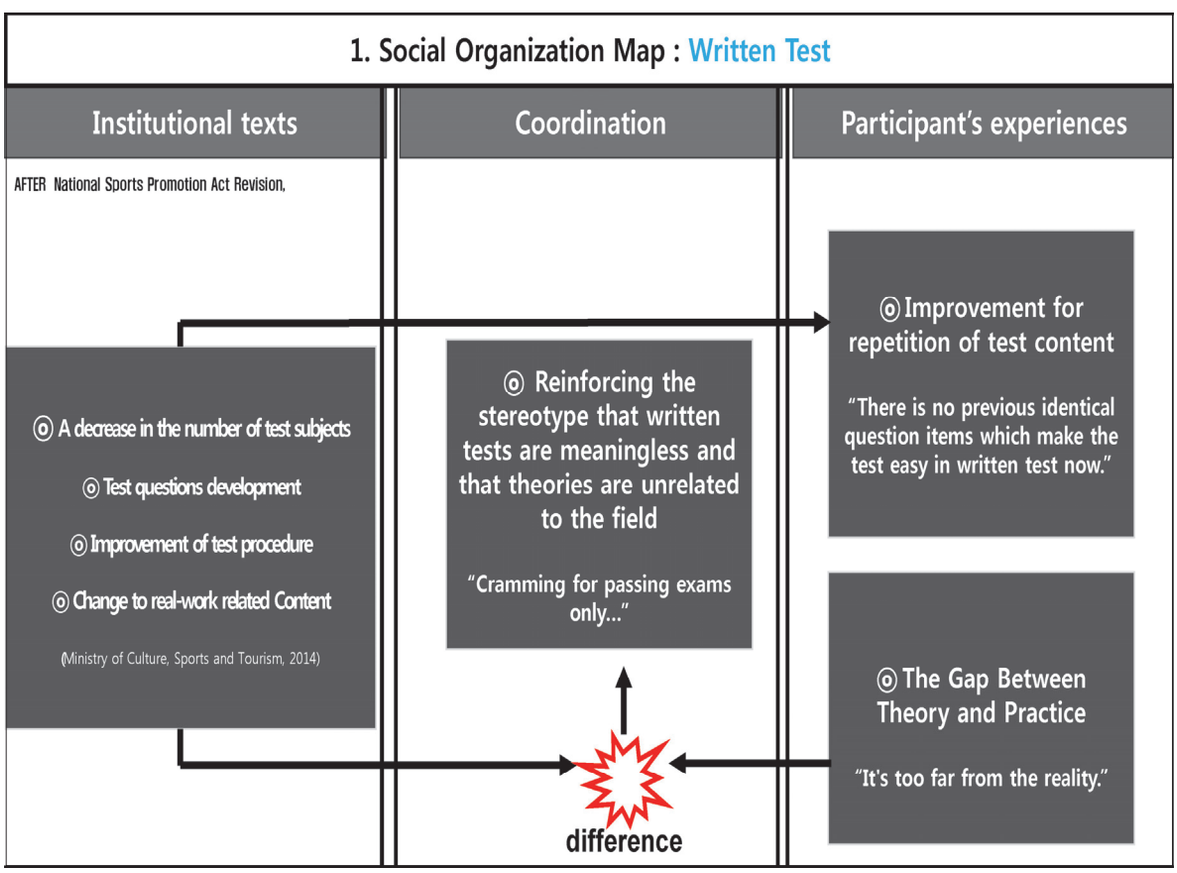
③ Currently working as sports coach

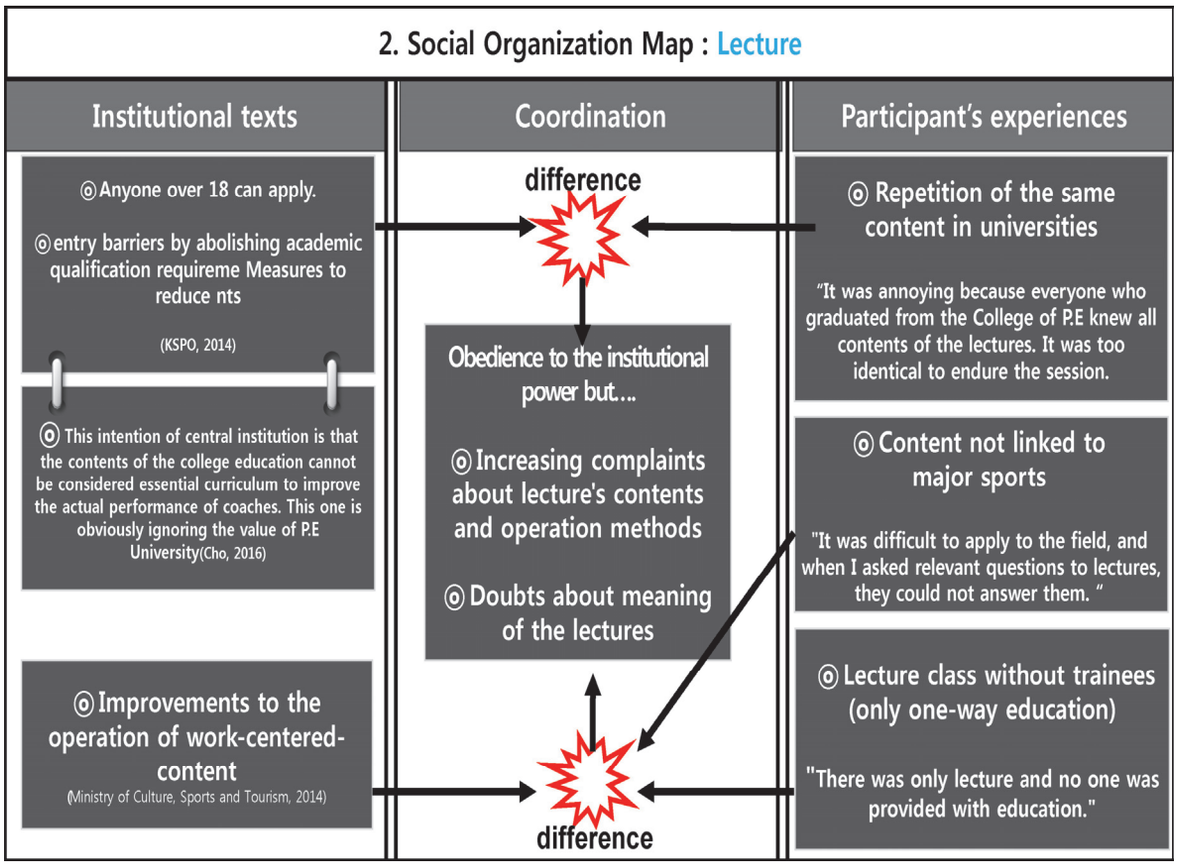
Sport	Sex	Academic Background	Currently Working
Taekwondo	Female	Bachelor's Degree	O
Basketball	Male	Bachelor's Degree	O
Gate ball	Female	Bachelor's Degree	O
Tennis	Male	Bachelor's Degree	O
Body-Building	Female	Bachelor's Degree	O
Body-Building	Female	Bachelor's Degree	O
Swimming	Male	Bachelor's Degree	O
Wrestling	Male	Bachelor's Degree	O
-	-	-	-

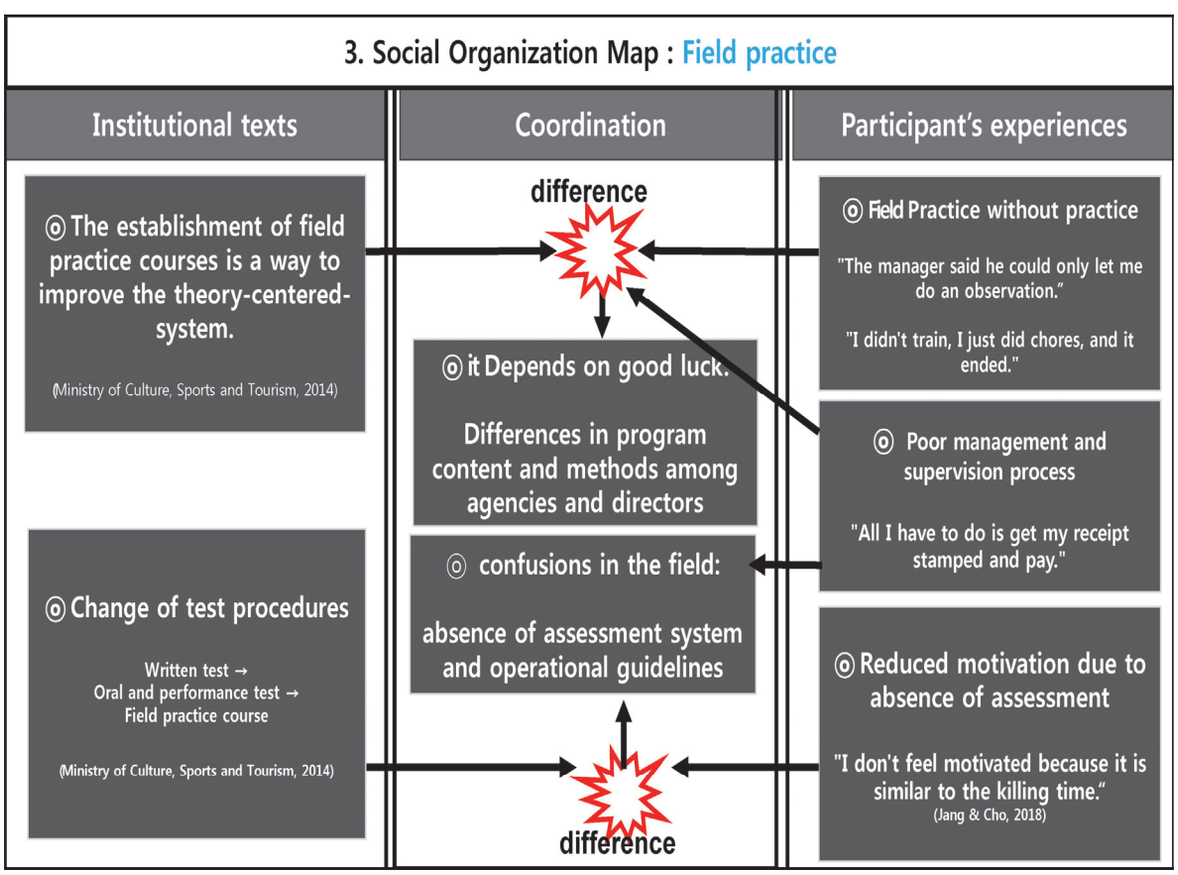
Data Collection & Analysis



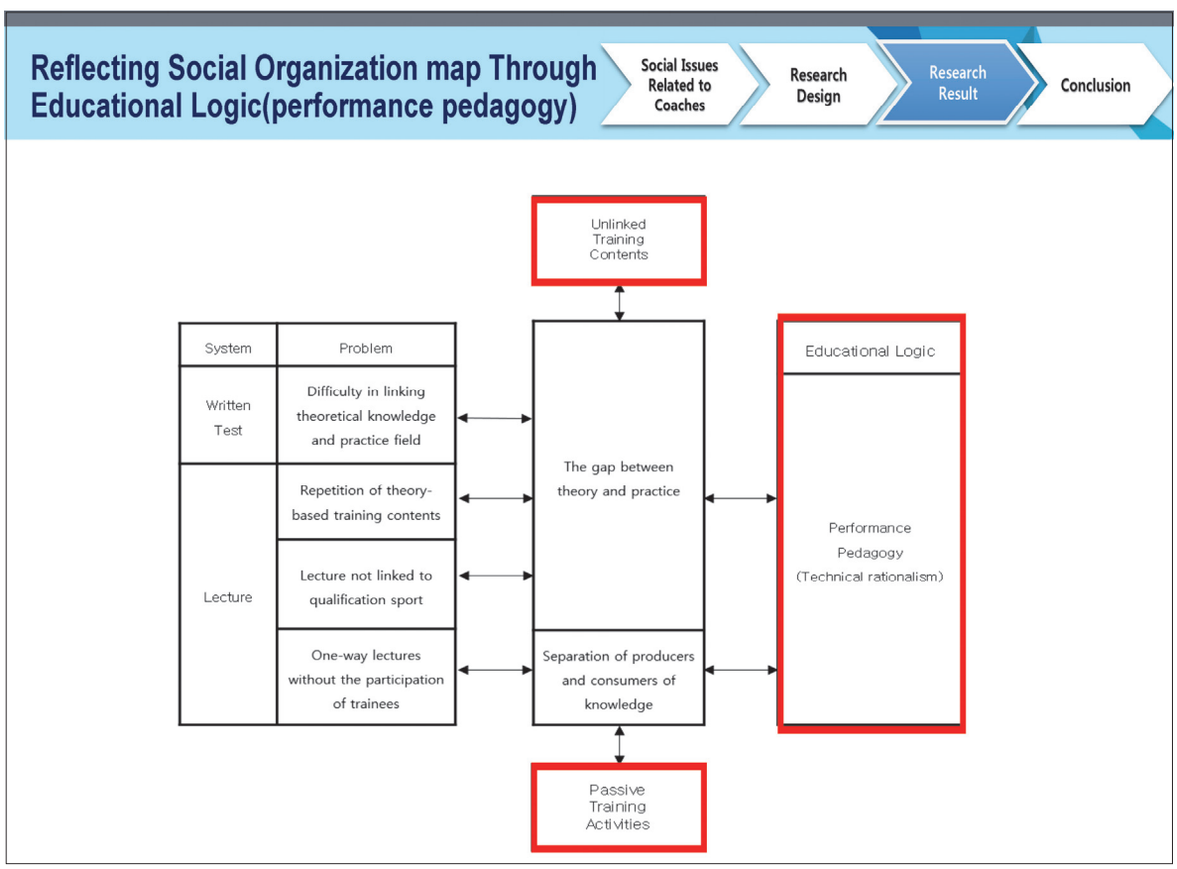

Social Issues Related to Coaches
Research Design
Research Result
Conclusion
3. Research Result:
① Coordination process between
Participants' experiences
and qualification system's
institutional texts
International Council for Coaching Excellence, 2013


1. Social Organization Map : Written Test
Institutional texts
Coordination
Participant's experiences
AFTER National Sports Promotion Act Revision,
ⓞ A decrease in the number of test subjects
ⓞ Test questions development
ⓞ Improvement of test procedure
ⓞ Change to real-work related Content
(Ministry of Culture, Sports and Tourism, 2014)
ⓞ Reinforcing the stereotype that written tests are meaningless and that theories are unrelated to the field
"Cramming for passing exams only..."
ⓞ Improvement for repetition of test content
"There is no previous identical question items which make the test easy in written test now."
ⓞ The Gap Between Theory and Practice
"It's too far from the reality."
difference


2. Social Organization Map : Lecture
Institutional texts
Coordination
Participant's experiences
ⓞ Anyone over 18 can apply.
ⓞ entry barriers by abolishing academic qualification requireme Measures to reduce nts
(KSPO, 2014)
ⓞ This intention of central institution is that the contents of the college education cannot be considered essential curriculum to improve the actual performance of coaches. This one is obviously ignoring the value of P.E University(Cho, 2016)
ⓞ Improvements to the operation of work-centered-content
(Ministry of Culture, Sports and Tourism, 2014)
difference
Obedience to the institutional power but...
ⓞ Increasing complaints about lecture's contents and operation methods
ⓞ Doubts about meaning of the lectures
difference
ⓞ Repetition of the same content in universities
"It was annoying because everyone who graduated from the College of P.E knew all contents of the lectures. It was too identical to endure the session.
ⓞ Content not linked to major sports
"It was difficult to apply to the field, and when I asked relevant questions to lectures, they could not answer them. "
ⓞ Lecture class without trainees (only one-way education)
"There was only lecture and no one was provided with education."


3. Social Organization Map : Field practice
Institutional texts
Coordination
Participant's experiences
ⓞ The establishment of field practice courses is a way to improve the theory-centered-system.
(Ministry of Culture, Sports and Tourism, 2014)
ⓞ Change of test procedures
Written test →
Oral and performance test →
Field practice course
(Ministry of Culture, Sports and Tourism, 2014)
difference
ⓞ it Depends on good luck.
Differences in program content and methods among agencies and directors
ⓞ confusions in the field:
absence of assessment system and operational guidelines
difference
ⓞ Field Practice without practice
"The manager said he could only let me do an observation."
"I didn't train, I just did chores, and it ended."
ⓞ Poor management and supervision process
"All I have to do is get my receipt stamped and pay."
ⓞ Reduced motivation due to absence of assessment
"I don't feel motivated because it is similar to the killing time."
(Jang & Cho, 2018)


Social Issues Related to Coaches
Research Design
Research Result
Conclusion
3. Research Result:
② Reflecting Social Organization map Through Educational Logic
International Council for Coaching Excellence, 2013


Reflecting Social Organization map Through Educational Logic(performance pedagogy)
Social Issues Related to Coaches
Research Design
Research Result
Conclusion
Unlinked Training Contents
System
Problem
Written Test
Difficulty in linking theoretical knowledge and practice field
Lecture
Repetition of theory-based training contents
Lecture not linked to qualification sport
One-way lectures without the participation of trainees
The gap between theory and practice
Separation of producers and consumers of knowledge
Educational Logic
Performance Pedagogy (Technical rationalism)
Passive Training Activities

Performance Pedagogy

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

Characteristics

- This approach that want to make professional groups regards that scientific knowledge must be secured (Hoyle & John, 1995; McCullough, 1987)
- By applying scientific theories and techniques, we can train more effective educators.(Hoyle, 1980)
- What an learner should do is to accept the authority of knowledge produced by experts or professors and apply it to practice. (Kirk, 1986; Mckay, Gore & Kirk, 1990)
- The view emphasizes the direction from theory to practice focusing on efficiency and effectiveness(Carlssson, 1999; Clandinin, 1995).

Limit

- It tends to collect theoretical subjects that are not relevant to the field (Barone, Berliner, Blanchard, Casanova & McGowan, 1996)
- There are a lot of cases that the knowledge acquired passively in the preliminary training is washed-out(Zeichner & Tabachnick, 1981).
- Competencies required in the field of P.E are closer to practical, empirical, personal judgment than conceptual, theoretical and academic knowledge.(Lawson, 1988)
- Since problems in the field of P.E cannot be solved by memorizing knowledge, the relationships between the environment and learners should be considered(Choi, 2009).

Performance Pedagogy's Limitions in Certificate Program

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

① The Gap Between Theory and Practice

2. <보기>에서 괄호에 들어갈 명칭은?

<보기>

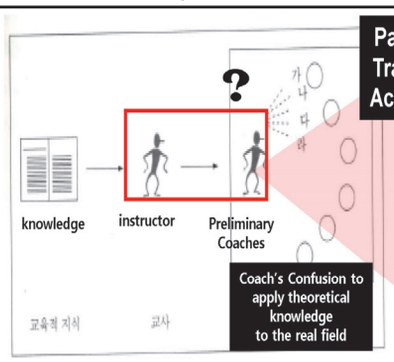
미국 운동생리학의 역사는 1920년대 호흡생리학의 권위자인 핸더슨(L. Henderson)이 설립한 ( )에서 시작 되었으며, 이곳에서 최대산소섭취량과 산소부채, 탄수화물과 지방 대사, 환경생리학, 임상생리학, 노화, 혈액 및 체력 등 여러 분야의 연구가 수행되었다.

① 하버드피로연구소(Harvard Fatigue Lab.)
② 아우구스트크로그연구소(August Krogh Lab.)
③ 크리스티안보어연구소(Christian Bohr Lab.)
④ 카롤린스카연구소(Karolinska Institute)

One of the written test questions 2015-2020.

Unlinked Training Contents

② Separation of Producers a Consumers of Knowledge

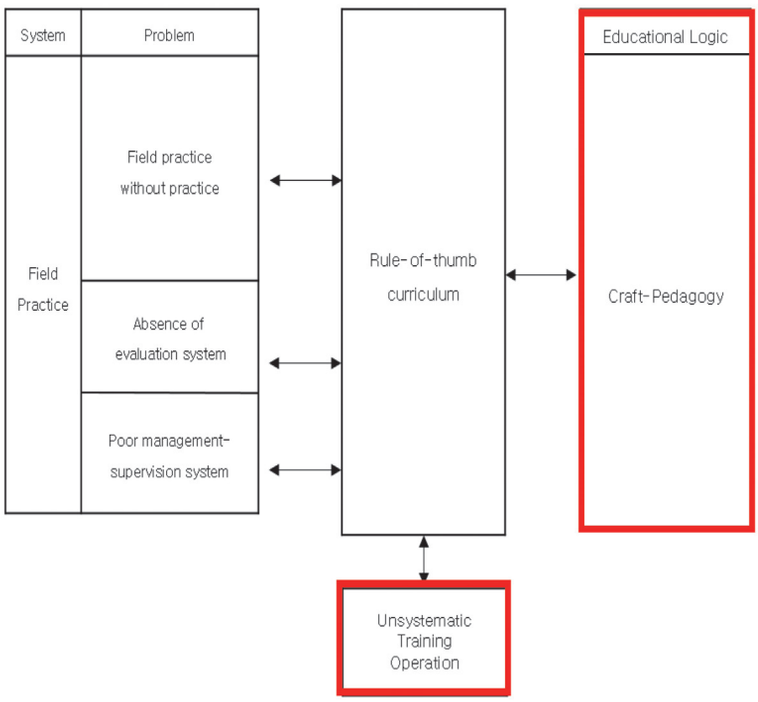


Passive Training Activities

https://m.blog.naver.com
https://brunch.co.kr/@benkim7713

Reflecting Social Organization Through Educational Logic (Craft-Pedagogy)

Social Issues Related to Coaches | Research Design | Research Result | Conclusion



Craft-Pedagogy

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

Characteristics

- Practical training has the advantage of being able to embody practical knowledge in the process of observing and imitating the behavior of skilled craftsmen. (Lave & Wenger, 1991).
- The view is that when you know what to teach, you will naturally realize how to teach in the field (Choi, 2009).
- This view is explained by the rule of thumb, focused on advice rather than teaching theory, and advocates of this view prefer the apprenticeship's long hours of practice (Tinning, 1991).

Limit

- It was criticized for not being based on more systematic, objective and reasonable results because it depends on skilled master's personal experience of (Choi, 2009).
- It is too dependent on the subject matter, so learning achievement is likely to be inefficient (Berliner & Rosenshine, 1987).
- Masters' power is enough strong to operate education program in unsystematic manner considering their own position first rather than the educational schedule, contents and operation method.

Craft-Pedagogy's Limitations in Certificate Education Program

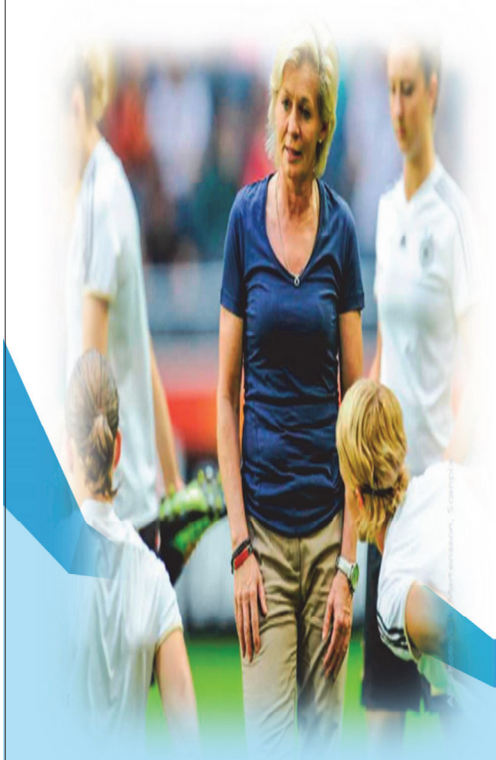
Social Issues Related to Coaches | Research Design | Research Result | Conclusion

Rule of Thumb Style of Curriculum

Unsystematic Training Operation

Field practice without practice	Absence of Evaluation Process	Poor Supervision and Management process
No field practice	No evaluation process after field practice	No guideline for organization and surveillance system

http://videolog.blog.naver.com



3. Research Result:

③ Alternative Educational Logic for Improving Qualification System

International Council for Coaching Excellence, 2013

Reflective Pedagogy

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

Linked Training Contents

Proactive Training Activities

Systematic Training Operation

Reflective Pedagogy

Unlinked Training Contents

Passive Training Activities

Unsystematic Training Operation

Characteristics

- In order to improve the problem of reality, the establishment of theory must be made within the actual field, not in the direction of applying it to practice after the theory acquisition(Schon, 1983)
- Reflection on the in the field does not presuppose an intermediate stage of 'application' from laboratory to the field because this view regards the epicenter of practical knowledge is the performer's reflection in the field(Choi,1995).
- The view shows a teacher as an active researcher who constructs, applies, and develops new theories through their own reflection in their field than a separate role as a provider and consumer of knowledge(Seo, 2007).
- Above all, systematic reflection about experience is important in this view, to this end, a more structured and procedural practice of reflection is required(Korthagen et al. 2007).

Reflective Pedagogy

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

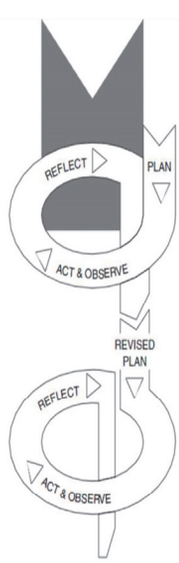
Limit

- Due to the ambiguous nature of reflection, it is often understood as simply thinking and carried out.
- Methodological difficulties in promoting self-reflection of the novice Because there are some Possibility that preliminary ones finish their course without reflection killing time.

But

- Constructivist educators have come up with various ways to overcome these misconceptions and limitations of self-reflection.

(Choi, 1998; Seo, 2005; Korthgen, 2007; kemmis & mctaggart, 1988)



Action research

Problem based discussion

Community of Practice

And so on...

Specific measures based on reflective pedagogy

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

Linked Training Contents

The development for sports-centered-written-test-questions(ex, soccer- sociology, taekwondo-history) are required to take into account the specificity of sports context rather than academic-oriented test questions(ex sociology, history).

1 Development of Practical Test Questions Based on each sport

2 Discussion Learning with Similar Sport Groups

Discussion parts including issues in the field need to be established in the lecture session to expedite preliminary coach's ability of reflection and participation into the lecture.

Also, discussion groups can be separated into similar sports categories(such as net, hit, and domain types) to secure the specificity and uniqueness of each sport context.

Reflective pedagogy

Topics or Problem-based-field practices are needed rather than depending solely on observation of instructor's behavior By specifying and systematizing the process of field practice based on real issues of the field with preliminary coach's own participation.

3 Problem-based action research (Field Practice)

Proactive Training Activity

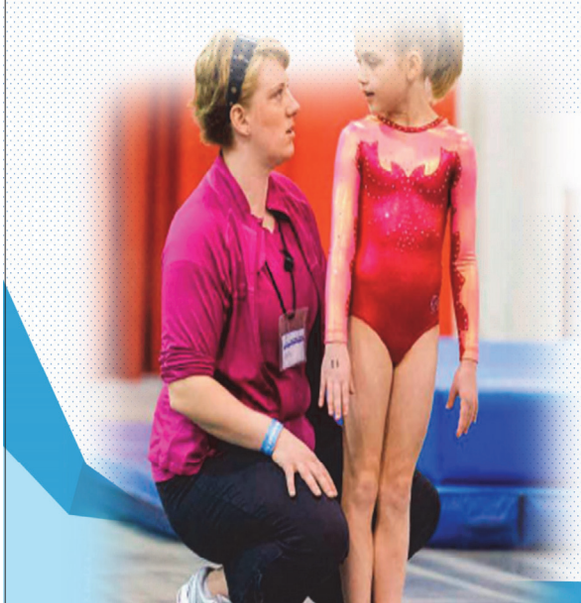
4 Developing Guidelines for operation and Establishing an Evaluation System in the field practice

Systematic Training Operation

While the guidelines for field practice session should be added, sub-institutions require partial autonomy to operate the field training session in accordance with the educational environment.

Also, Instructor's evaluation for preliminary coach's level of skills, knowledge application ability and participation and so on. And Center institution's report evaluation System are need to be established

Social Issues Related to Coaches | Research Design | Research Result | Conclusion



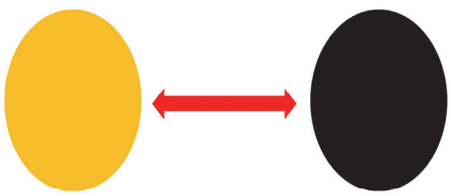
4. Conclusion

International Council for Coaching Excellence, 2013

1. Not Coordination but Obedience!

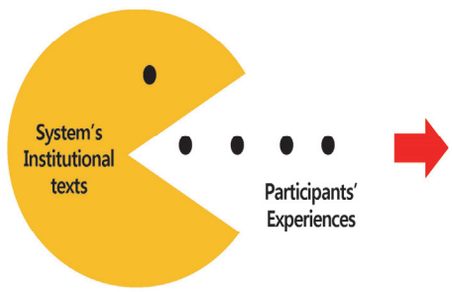
Social Issues Related to Coaches | Research Design | Research Result | Conclusion

Not coordination



it is questionable that individuals' active nature to compete the institutional texts can actually happen in real life or not because in papers of institutional ethnography so far, the active nature of the individuals is barely obvious(kim, 2003).

But obedience!

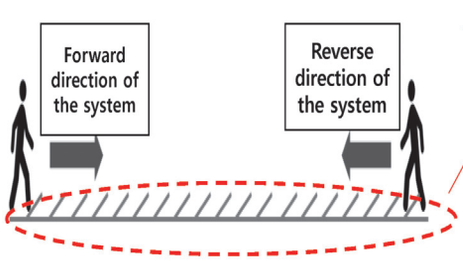


Regardless of whether the system process is working properly or not, The institutional texts tend to make participants accept the un-educational factors in the qualification system rather than keeping resist

2. What should we do to overcome the institutional texts' power?

Social Issues Related to Coaches | Research Design | Research Result | Conclusion

A solid institutional arrangement(obstacle) is in the place when system's regulatory and normative mechanisms work together, which easily directs individuals' actions in a particular direction
(Lowndes & Roberts, 2013).

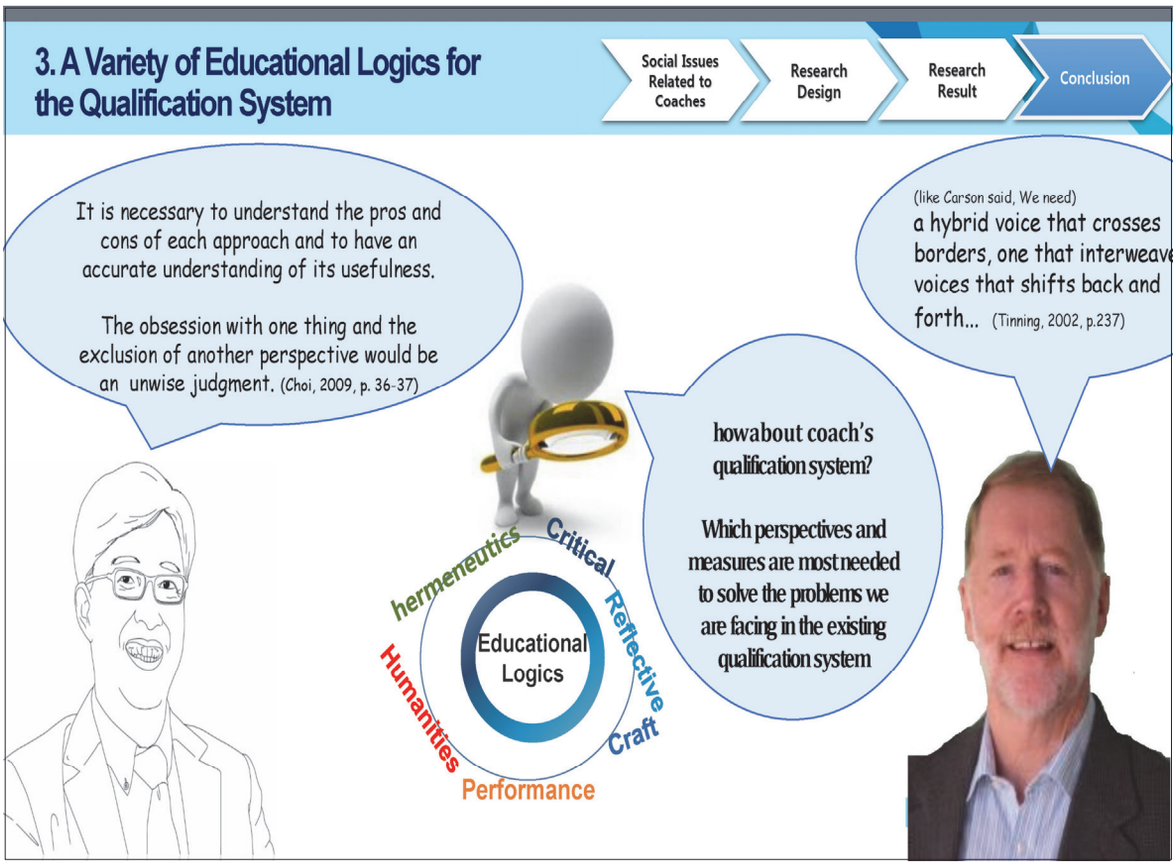


individuals who adapt (left) to and disobey (right) institutional arrangements (Tak, 2018)

Institutional arrangement which was made by a lot of individual texts is **invisible**

In order to prevent preliminary coaches from obeying uncritically to non-educational elements in the qualification system due to institutional texts' power overwhelming individuals' experiences.

we should try to constantly find out and check the invisible institutional arrangement and educational logic flowing under the qualification training system.


3. A Variety of Educational Logics for the Qualification System
Social Issues Related to Coaches
Research Design
Research Result
Conclusion
It is necessary to understand the pros and cons of each approach and to have an accurate understanding of its usefulness.
The obsession with one thing and the exclusion of another perspective would be an unwise judgment. (Choi, 2009, p. 36-37)
(like Carson said, We need)
a hybrid voice that crosses borders, one that interweave voices that shifts back and forth... (Tinning, 2002, p.237)
howabout coach's qualification system?
Which perspectives and measures are most needed to solve the problems we are facing in the existing qualification system
hermeneutics
Critical
Reflective
Craft
Performance
Humanities
Educational Logics


Thank You

SESSION 02

2020
Global Sport Science
Virtual Conference

7. The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related-Facilities

Based on the Interrupted Time Series Analysis

▸▸ Ahn, Chiyoung
(Seoul National University)

Presentation Title 7

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related-Facilities

Based on the Interrupted Time Series Analysis

Ahn, Chiyoung (Seoul National University)

The subjects of this study are two different food stores located in Seoul National University. We conducted an intervention study by using NUTRI-SCORE labeling. NUTRI-SCORE is one of the Front-Of-Pack(FOP) labeling methods which were made for enhancing consumer's food consumption behaviors by reconstructing and revealing nutritional information of food items. NUTRI-SCORE labeling divides food into five grades (A, B, C, E, D) based on reconstructed nutritional information of each food.

The purpose of this study is to see the effect of NUTRI-SCORE labeling on the sales of Sports-related facilities and Non-sports-related facilities. We want to know which store or which specific group shows more effectiveness with NUTRI-SCORE labeling. In other words, we were trying to see how NUTRI-SCORE effects on sales of two different stores and each of their food items by improving food consumer's understanding of nutritional information.

Therefore, this study assumed that consumers at sports-related facilities would have more intention to purchase a higher grade of food (which means healthier food) and we wanted to verify a relationship between the existence of sports facilities and the intention to purchase foods.

First, the NUTRI-SCORE label was attached to the entire food price tag of Seoul National University's two different food stores (Sports-related facilities and Non-sports-related facilities). The labeling attached items were sold for five weeks.

Second, we got the sales of two food store before the study (sales data over the past two years). And we added and compared them with the sales details that occurred during the intervention period of this study.

Finally, trend and changes in total sales details were analyzed through the interrupted time series analysis.

The final result of this study was based on a time series analysis and statistical data. Therefore, it would be useful for marketing research for food consumers, public health research to improve nutritional related behavior, and sports participation research related to consumers' cognitive consumption patterns that is differentiated by the presence or absence of sports facilities.

Seoul National University November 2020

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities -Based on the Interrupted Time Series Analysis-

Global Sport Management
Chiyoung Ahn

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INDEX

2

Change in Korea Food Culture

More than half of Korean adults eat out more than one meal a day. Korean adults consume a quarter of their total calories a day by eating out(Choi, 2017).

The dietary patterns in the home are changing and the proportion of non-home diets is increasing. In the past, it used to be a home-cooked meal, but now it is buying various processed foods and convenience foods and eating them. This trend will continue to spread further(Hah & Moon, 2008).

3

The Importance of Nutrition in University Students

Young adulthood is a time when individuals, having only recently left the family home, are beginning to make more independent choices about food and a time when many individuals adopt unhealthy dietary behaviors and gain excess weight(Graham & Laska, 2012).

The Nutrition Status of Korean University Students

The results of a study that analyzed the consumption patterns of Korean university students indicated that their energy consumption was less than the amount recommended for a healthy lifestyle(Jang et a., 2011).

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I. 연구 배경 및 필요성

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Status of Food Nutrition Labeling

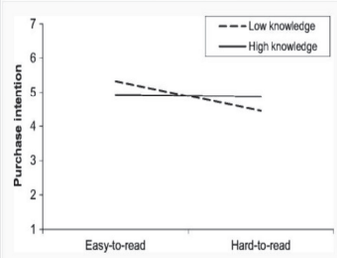

Fig. 2
Purchase intention as a function of nutrition labeling type and subjective nutrition knowledge

(table 1. Making healthy food choices using nutrition facts panels. The roles of knowledge, motivation, dietary modifications goals, and age, Miller & Cassady, 2012)

표 8. 전공에 따른 영양표시 인지, 확인 및 확인 이유

		식품 전공	비식품전공	X^2	p-value
영양표시 인지	예	35(66.0)	18(34.0)	14.213***	0.000
	아니오	16(29.6)	38(70.4)		
영양표시 확인	항상확인	7(70.0)	3(30.0)	0.502	0.778
	가끔확인	24(64.9)	13(35.1)		
	확인하지않음	2(50.0)	2(50.0)		
확인하는 이유	영양소 함량확인	17(68.0)	8(32.0)	2.208	0.530
	건강	4(50.0)	4(50.0)		
	제품 비교	6(85.7)	1(14.3)		
	체중관리	7(63.6)	4(36.4)		
확인하지 않는 이유	관심없음	1(33.3)	2(66.7)	10.347*	0.016
	글씨가 작아 읽기 어려움	1(25.0)	3(75.0)		
	영양표시복잡	1(20.0)	4(80.0)		
	습관적으로 그냥 구입	15(83.3)	3(16.7)		

N(%)
*** p<0.001 , ** p<0.01 , * p<0.05

(table 2. Nutrition Labeling in Korea and Canada: Policy Implications, Kim & Lee, 2016)

The demand for accurate and relevant nutrition information is increasing and the number of consumers who need it is increasing. While there are countless studies regarding the hygiene in the restaurant industry, research on nutritional information is limited and inadequate(Kwon et al., 2010).

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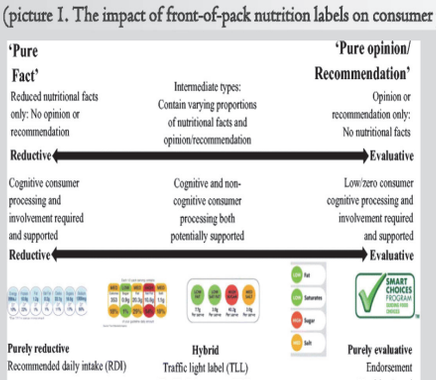
I. 연구 배경 및 필요성

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Front-of-pack(FOP) Label

You can use front-of-pack labelling to identify healthy foods and drinks, by choosing more green-labeled foods and avoiding red-labeled foods. Front-of-pack labelling provides consumers with an intuitive means of distinguishing between healthy products and non-healthy products.

(picture I. The impact of front-of-pack nutrition labels on consumer product evaluation and choice: an experimental study. Hamlin et al., 2015)



The World Health Organization (WHO) and the Organization for Economic Cooperation and Development (OECD) judged that re-marking nutrition information that is provided on the back of food products in a condensed or different way and moving it to the front helps consumers make health-aware purchases. Therefore, the Front-of-pack (FOP) labeling format was proposed as an important strategy for solving nutritional-related diseases(OECD, Promoting Sustainable Consumption, 2008).

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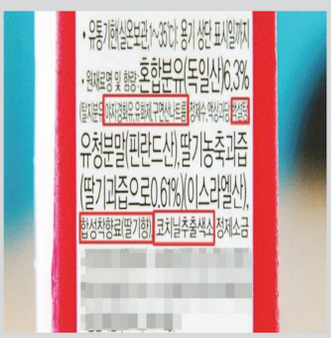
I. 연구 배경 및 필요성

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

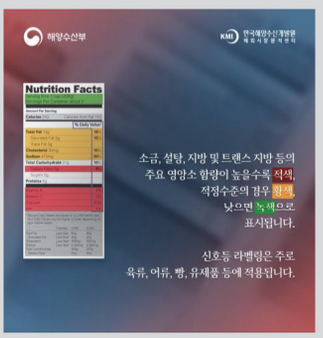
Nutri-Socre

The Nutri-Score is a nutrition label that converts the nutritional value of products into a simple code consisting of 5 letters, each with its own color. Each product is awarded a score based on a scientific algorithm. This formula takes into account the nutrients to avoid (energy value and the amount of sugars, saturated fats and salt) and the positive ones (the amount of fiber, protein, fruit, vegetables and nuts, rapeseed oil, walnut oil and olive oil). You can see at a glance which products are recommended and which should be avoided.

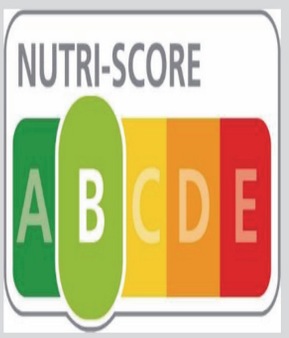
(picture 2-1.) Google



(picture 2-2.) Korea Maritime Institute



(picture 2-3) nutriscore.colruytgroup.com



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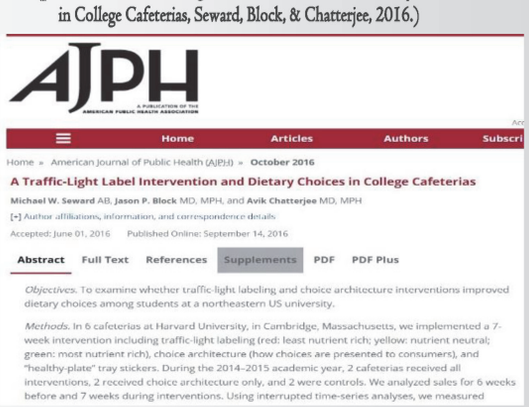
I. 연구 배경 및 필요성

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

(picture 3-1. Nutri-Score and supporters, Google.)

(picture 3-2. Seoul National University POSCO Center , Google.)

(picture 3-3. A Traffic-Light Label Intervention and Dietary Choices in College Cafeterias, Seward, Block, & Chatterjee, 2016.)



Post-intervention athletes were more likely than nonathletes (70% vs 55%) to report that traffic-light labels were helpful. Post-intervention men and athletes were more likely to say traffic light labels should continue to be used or had no preference. Seward, Block, & Chatterjee, 2016.

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2. 연구의 목적

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Improving One's Attitude Toward Health

The higher the subjective understanding of nutrition labeling information, the higher the willingness to purchase foods that we believe are healthy(Hawley et al., 2013).

Improving Food Purchasing Habits by Developing Health Literacy*

Health literacy is "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions". Health literacy is emerging as one of the most important cross-cutting issues to affect health in the United States(Carbone & Zoellner, 2012).

Health literacy is "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions"

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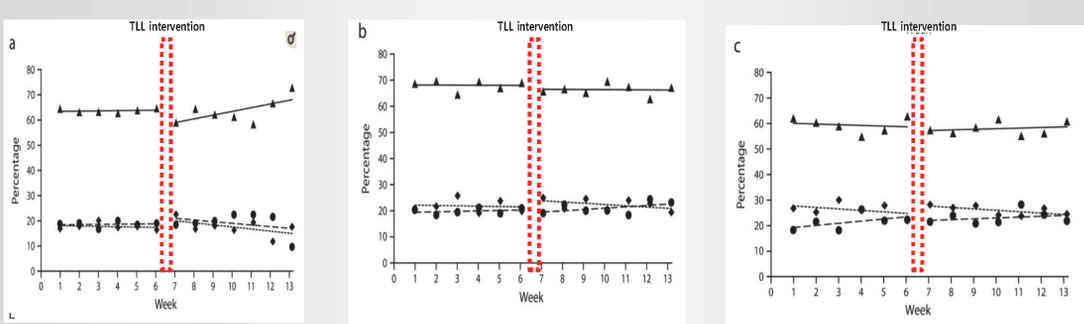
3. 이론적 배경

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-



(a) Full-Intervention, (b) Minimal-Intervention, and (c) Control Cafeterias: Harvard University, Cambridge, MA, 2014

Green	Yellow	Red
Linear (Green)	Linear (Yellow)	Linear (Red)

(table 3. A Traffic-Light Label Intervention and Dietary Choices in College Cafeterias)

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3. 이론적 배경

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

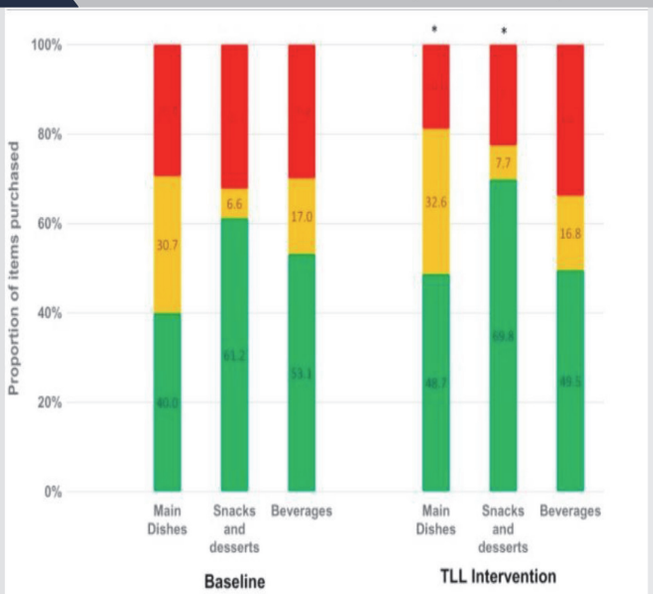

Fig. 1. Purchase of green, yellow and red light items according to type of item. *$p < 0.01$ for comparison of proportion of green, yellow and red light purchases between the baseline and traffic light labeling intervention periods. TLL: traffic light labeling.

(table 4. Using traffic light labels to improve food selection in recreation and sport facility eating environments)

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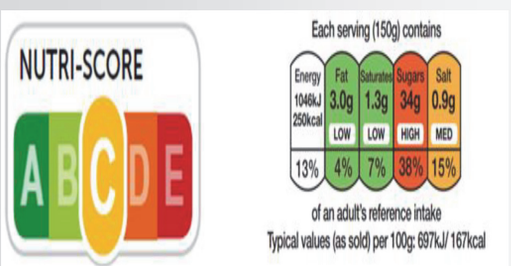
3. 이론적 배경

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-



+ Intuitive: Easy to see and understand
+ Simple: A single score limits the amount of knowledge needed for interpretation
+ Balanced: Includes positive elements in the calculation, such as fibres or micro-nutrients
- A black box: Calculation not visible, so trust is required, and some consumers consider it an oversimplification

+ Complete: A lot of information in one label
+ Transparent: Contents fully visible
- Difficult: Small print, content requires knowledge
- Complex: No single, clear outcome
- Redundant: Most of the information is already on the back of the packaging

(table 5. Comparison of Nutri-Score and Most Popular Traffic Light Labeling, Rabobank, 2018)

Modified Existing Method(Nutri-Score)

A comparative study of various packaging labeling formats conducted from 2014 to 2017 concluded that they were superior to other forms(Chantal, Hercberg, & Organization, 2017).

Points	Energy (kJ)	Sugar (g)	Saturated fatty acids (g)	Sodium (mg)
0	≤ 335	≤ 4,5	≤ 1	≤ 90
1	> 335	> 4,5	> 1	> 90
2	> 670	> 9	> 2	> 180
3	> 1005	> 13,5	> 3	> 270
4	> 1340	> 18	> 4	> 360
5	> 1675	> 22,5	> 5	> 450
6	> 2010	> 27	> 6	> 540
7	> 2345	> 31	> 7	> 630
8	> 2680	> 36	> 8	> 720
9	> 3015	> 40	> 9	> 810
10	> 3350	> 45	> 10	> 900
TOTAL	1 point	0 points	0 points	7 points

Points	Fruit, vegetables (%)	Fibers (g)	Proteins (g)
0	≤ 40	≤ 0,9	≤ 1,6
1	> 40	> 0,9	> 1,6
2	> 60	> 1,9	> 3,2
3	-	> 2,8	> 4,8
4	-	> 3,7	> 6,4
5	> 80	> 4,7	> 8,0
TOTAL	0 points	5 points	5 points

7 ⊖ 10 = -3 ⊖ A

(table 6. Nutri-Score Profiling System, nutriscore.colruytgroup.com.)

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3. 이론적 배경

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Clustering of Health Behaviors

● If a lot of people are doing a particular action, it is likely that they think it is wise to carry it out(Cialdini, 2007).

● Among the eight items, active physical activity was most related to eating healthy food(Johnson, Nichols, Sallis, Calfas, & Hovell, 1998).

● Certain actions may not be recognized as problem behavior depending on the area to which they belong. In other words, in areas with relatively high prevalence rates, clustering can be affected as part of existing behavior rather than problem behavior(Lee C. G., Seo D-C, Middlestadt, & Lin, 2015).

● The lower social class is likely to adopt unhealthy behavior patterns. In contrast, women in higher social strata and those over 65 are likely to be in the Healthy Lifestyle cluster(Conry et al., 2011).

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4. 연구 가설

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

H 1-1 : NUTRI-SCORE's involvement will have a static (+) impact on the sales rates of food stores A grade and B grade in sports facilities.

H 1-2 : NUTRI-SCORE's involvement will have an amulet (-) effect on the sales rates of food stores rated C, D and E grades in sports facilities.

H 2 : NUTRI-SCORE intervention will have the same effect on non-sports facilities.

H 3 : The influence of NUTRI-SCORE intervention will be more static, amulet-correlations in sports facilities and more numerically visible.

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5. 연구 방법

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Materials and Objectives

Location: Food stores in POSCO Center,
Dongwongwan Cafeteria
(both located inside Seoul National University)

Data: Food sales data from desks for about two years from 2018 to 2019, food sales data for five weeks after research intervention on November 18

Target: Sales of two food stores during the period limited by researchers

Reason for limiting period: During the weekend, POSCO Center is mainly used by faculty members' families and outsiders. Dongwon-gwan stores don't work during the weekend. Therefore, Saturdays, Sundays, and vacations are not included in the study period.

It was submitted to the Institutional Review Board (IRB) of Seoul National University on October 04th, 2019 and the review was completed.

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5. 연구 방법

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Basic Information on POSCO Stores

Location in Complex Exercise Facility
(Health center, screen golf course, swimming pool, squash zone, information desk, etc.)
Interior Area: 9 square meters
Daily number of passengers: 150 to 200 (on weekdays)
MAIN USE: Students, faculty, and staff
Operating hours: 8 hours
How to Work: Two employees work shifts in the morning and afternoon.
Number of food sold: 104 in total
(less than 10 products will be changed according to the distribution situation.)

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5. 연구 방법

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Basic Information on Dongwon-gwan Stores

Interior area: 11 square meters.

Daily number of passengers: 280 to 320 (on weekdays)

MAIN USE: Students, faculty, and staff

Operating hours: 10 hours

Work style: Three employees work flexible shifts starting in the morning and afternoon.

Number of food sold: 1300 in total

(less than 30 products will be changed according to distribution conditions.)

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5. 연구 방법

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Sell food with NUTRI-SCORE label for 5 weeks

↓

Obtain data from two stores

↓

Through analysis of the intervention time series, we derive and analyze discriminatory results based on the presence or absence of sports facilities.

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Class A, B, C, D, E excluding snacks and ice creams

The daily sales of the classified items will be converted to the daily sales ratio from March 2, 2018 to December 20, 2019, using the SQL code of SAS 9.4.

```
proc sql;
 create table posco1 as
 select *, sum(ea) as sum_ea
 from posco
 group by grade, date /*같은날짜 분산이 되어있기 때문에 ea를 합산*/
 ;
 quit;

proc sort data = posco1 out = posco2 nodupkey;
 by grade sum_ea date;
 run; /*중복값제거 후 판매값이 300개 나옴 성공*/

proc sql;
 create table posco3 as
 select *, sum_ea *100 / sum(sum_ea) as percent
 from posco2
 group by date
 ;
 quit; /*grade를 그룹으로 엮으면 안되니까 day로만 엮음 성공*/

proc format
 picture three
 low-high ='99.999' ;
 picture two
 low-high ='99.99' ;
 run; /*소수점 정리*/
```

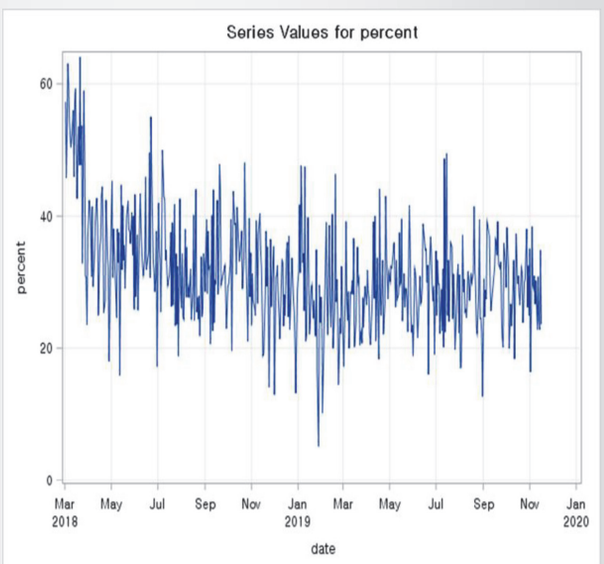
```
data posco4;
 set posco3;
 format percent two.;
 run; /*percent 소수점 셋째까지 정리하거나 둘째자리까지*/

 *Scatterplots;
 title "Scatterplot";
proc sgplot data=posco4;
 scatter x=day y=percent / group=grade;
 run;

 data posco5;
  set posco4;
  news = (date >= '18nov2019'd);
 run;

proc arima data=posco5;
  identify var=percent crosscorr=news;
  estimate p=1 q=1 input=news;
 run;

data posco6;
 set posco5;

 if grade='a' ;
 run;

proc arima data=posco6;
  identify var=percent crosscorr=news;
  estimate p=1 q=1 input=news;
```


5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Identification(1): Augmented Dickey Fuller Test



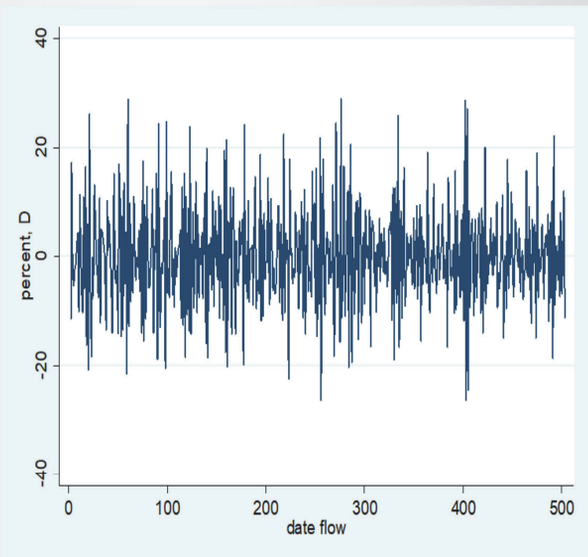
picture 4. The time series of drinks rated A at the POSCO store before DFT

5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Identification(1): Augmented Dickey Fuller Test



picture 5. After DFT, POSCO store's A-rated beverage series

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Identification(1): Augmented Dickey Fuller Test

Dickey-Fuller Unit Root Tests							
Type	Lags	Rho	Pr < Rho	Tau	Pr < Tau	F	Pr > F
Zero Mean	0	-764.382	0.0001	-40.10	<.0001		
Single Mean	0	-764.383	0.0001	-40.06	<.0001	802.48	0.0010
Trend	0	-764.393	0.0001	-40.02	<.0001	800.90	0.0010

table 7. POSCO store's E grade beverage DFT

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Research Results

Identification(2): White Noise

Autocorrelation Check for White Noise										
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations						
6	104.37	6	<.0001	-0.447	-0.043	-0.026	-0.001	-0.024	0.058
12	110.60	12	<.0001	0.028	-0.060	0.032	-0.054	0.053	0.032
18	119.79	18	<.0001	-0.055	-0.003	0.061	-0.092	0.045	-0.020
24	146.74	24	<.0001	-0.002	0.090	-0.073	-0.005	-0.061	0.184

table 8. White noise test of grade A general food products in POSCO store

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Research Results

Identification(2): White Noise + Residual test

Autocorrelation Check of Residuals									
To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	3.04	4	0.5505	0.060	-0.025	-0.040	-0.007	0.010	-0.001
12	9.02	10	0.5297	0.073	-0.002	0.028	0.006	0.067	0.033
18	16.16	16	0.4419	-0.056	-0.033	0.000	-0.092	-0.016	-0.027
24	28.86	22	0.1488	0.041	0.074	-0.061	-0.040	-0.040	0.100
30	41.03	28	0.0533	-0.124	-0.052	-0.005	-0.014	0.064	-0.018
36	45.59	34	0.0884	0.054	-0.007	-0.010	-0.055	-0.042	-0.025
42	56.77	40	0.0414	-0.020	-0.049	0.033	0.058	0.114	-0.016
48	66.65	46	0.0249	0.031	-0.013	-0.087	-0.014	-0.010	0.094

table 9. Residual Test of Class A General Food Products in POSCO Stores

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Estimation: Estimating the model with the autocorrelation function (ACF) and the partial autocorrelation function (PACF)

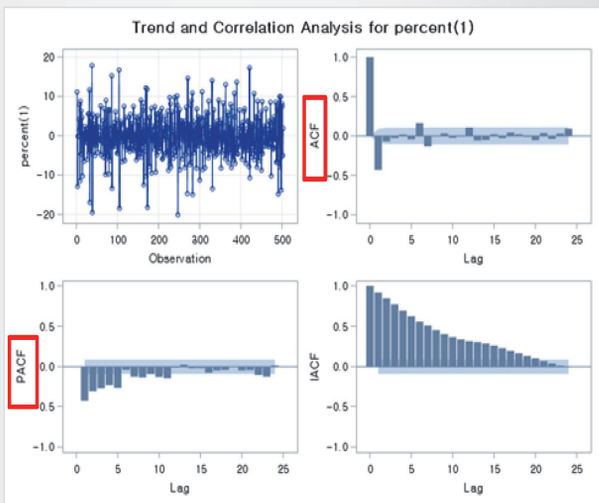

Table 10. Comparison of PACF and ACF of Class E general food products in POSCO stores (SAS 9.4).

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Estimation: Estimating the model with the autocorrelation function (ACF) and the partial autocorrelation function (PACF)

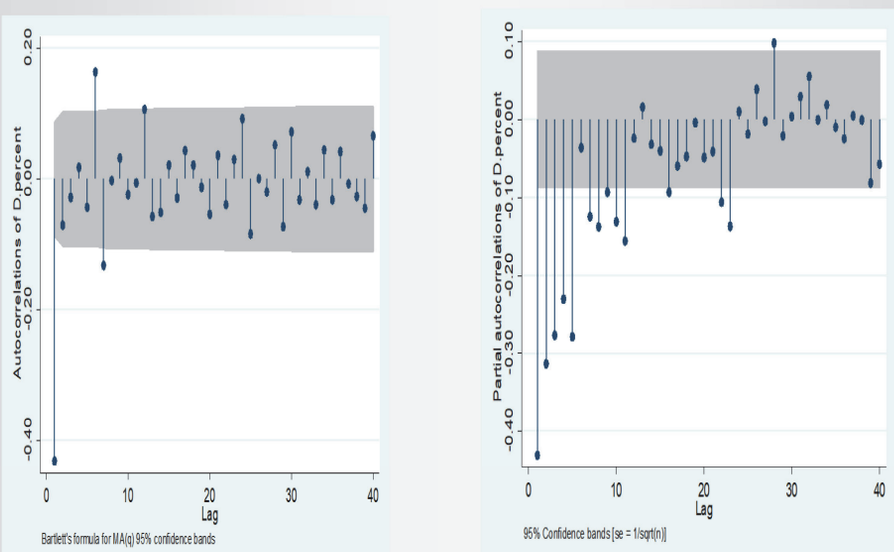

Table 11. Comparison of PACF and ACF of Class E general food products in POSCO stores (STATA 14)

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Prediction: Charts and Results Through ARIMA Process

Forecasts for variable percent				
Obs	Forecast	Std Error	95% Confidence Limits	
510	22.5278	8.6152	5.6424	39.4133
511	22.5264	8.6163	5.6388	39.4141
512	22.6291	8.6174	5.7392	39.5190
513	22.6158	8.6186	5.7237	39.5079
514	22.9208	8.6197	6.0265	39.8152
515	22.6401	8.6247	5.7360	39.5442
516	22.6354	8.6259	5.7290	39.5418
517	22.6326	8.6270	5.7239	39.5413
518	22.6278	8.6282	5.7168	39.5388
519	22.6286	8.6294	5.7153	39.5419
520	22.6190	8.6306	5.7033	39.5347
521	22.6143	8.6318	5.6963	39.5323
522	22.6096	8.6330	5.6893	39.5299
523	22.6049	8.6341	5.6823	39.5275
524	22.6003	8.6353	5.6754	39.5252
525	22.5955	8.6365	5.6683	39.5227
526	22.5908	8.6377	5.6612	39.5203
527	22.5861	8.6388	5.6542	39.5179
528	22.5814	8.6400	5.6472	39.5155
529	22.5767	8.6412	5.6402	39.5131
530	22.5719	8.6424	5.6332	39.5107

Table 12. ARIMA Prediction of Class A Beverage in the dongwon-gwan store

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Prediction: Charts and Results Through ARIMA Process

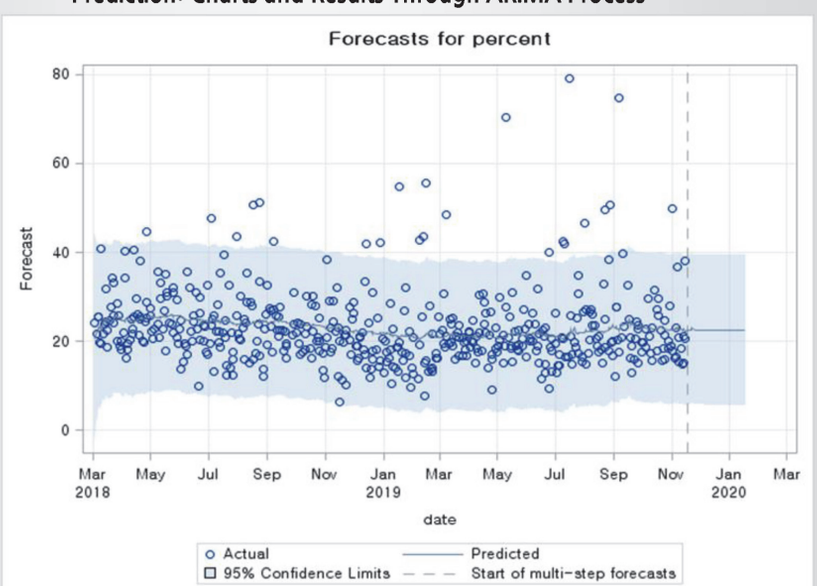

Table 13. Overall Time Series and Prediction Graphs of Class A beverages in the dongwon-gwan store

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Prediction: Charts and Results Through ARIMA Process

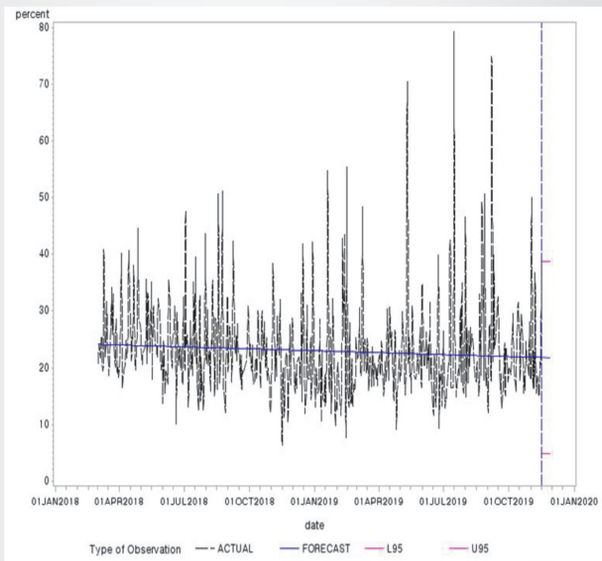

Table 14. Prediction graph of the dongwon-gwan store, including the upper and lower limits of Class A beverages

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Prediction: Charts and Results Through ARIMA Process

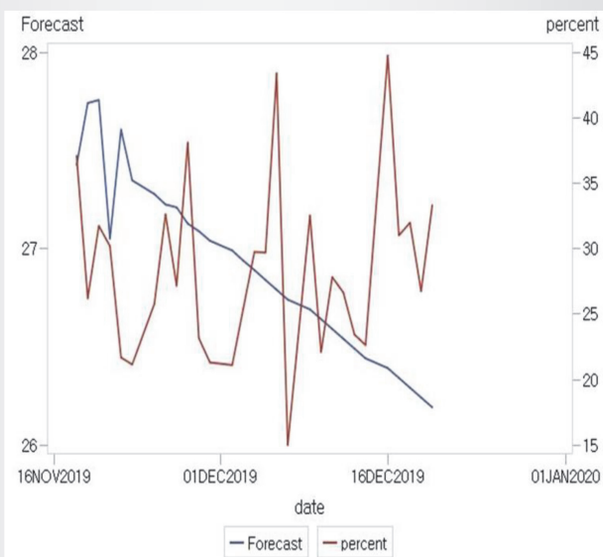

Table 15. Estimated and Actual Value of Class A Beverage in POSCO Store

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Prediction: Charts and Results Through ARIMA Process

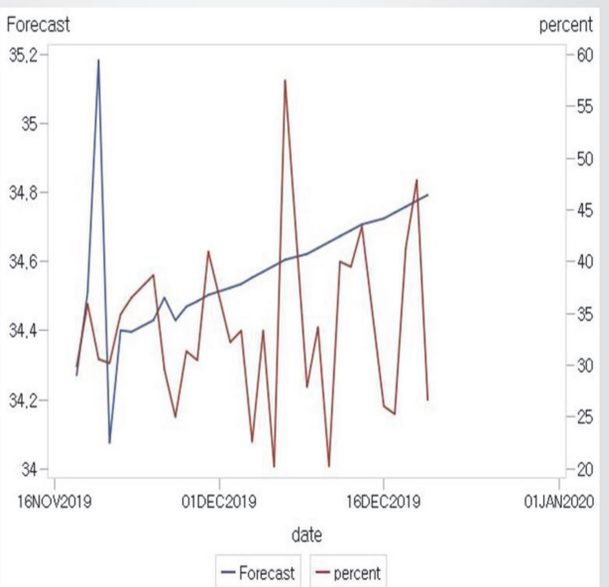

Table 16. Estimated and Actual Value of Class E Beverage in POSCO Store

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

	예측값(%)	실제값(%)
포스코 음료류 A	26.89	28.41
포스코 음료류 B	22.77	22.44
포스코 음료류 C	11.54	12.30
포스코 음료류 D	4.09	3.53
포스코 음료류 E	34.57	33.28
포스코 일반식품 A	72.31	70.80
포스코 일반식품 B	4.78	6.26
포스코 일반식품 C	8.96	10.52
포스코 일반식품 D	1.97	2.64
포스코 일반식품 E	12.80	12.20
동원관 음료류 A	22.59	20.28
동원관 음료류 B	16.90	16.70
동원관 음료류 C	9.66	10.09
동원관 음료류 D	4.39	4.12
동원관 음료류 E	46.44	48.69
동원관 일반식품 A	32.04	28.43
동원관 일반식품 B	9.37	11.37
동원관 일반식품 C	36.24	37.05
동원관 일반식품 D	3.71	4.46
동원관 일반식품 E	17.14	18.77

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Research Results

Real Value Forecast Independent Sample T Test, F Test

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	56	3.59	0.0007
Satterthwaite	Unequal	28.006	3.59	0.0013

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	28	28	9446.87	<.0001

Table 17. POSCO store's A grade beverage independent T test, F test

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5. 연구 결과

The Effect of NUTRI-SCORE Labeling on the Food Sales in Sports-related Facilities and Non-sports-related Facilities
-Based on the Interrupted Time Series Analysis-

Discussion and Conclusions

Before Intervention (March 2, 2018 to November 16, 2019)

POSCO A GRADE

Beverage : 31.55% General : 73.92%

POSCO E GRADE

Beverage : 34.38% General : 9.86%

Dongwon-Gwan A GRADE

Beverage : 22.96% General : 30.22%

Dongwon-Gwan E GRADE

Beverage : 47.66% General : 18.80%

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Discussion and conclusions

- Foundational Study
- Overcoming the Limitations of Prior Research
- Method of Calculation
- Intervention Period

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THE END

Thank You

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